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THE DETERMINATION OF FARMING COSTS

BY

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C. S. ORWIN

OXFORD
AT THE CLARENDON PRESS
1917

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[1] On active service.

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NOTE

In the investigation of farming costs undertaken by the Institute for Research in Agricultural Economics the Director desires to acknowledge the assistance or collaboration, in one form or another, of the following: G. S. Bedford, Berkshire County Council; B. W. Bull, Warwickshire County Council; Dr. Crowther, Leeds University; M. J. R. Dunstan, South-Eastern Agricultural College; F. V. Dutton, Devonshire County Council; F. M. Fells, Union Court, Old Broad Street, E.C.; G. H. Garrad, Kent County Council; L. P. Haynes, Boroughs Oak, East Peckham, Kent; Professor Hendrick, Aberdeen University; H. E. Pollock-Hodsoll, Wembley, Middlesex; J. Mackintosh, University College, Reading; E. C. Simon (the late), Lythe Hill Farm, Haslemere; F. Strover, 16 Tokenhouse Yard, E.C.; and Professor T. B. Wood, Cambridge University. Further, the most cordial acknowledgements are due to the farmers who have been willing to supply the very intimate information about their operations necessary for the investigations of the Institute. For obvious reasons their share in the work cannot be recorded by name, but without their help nothing could have been achieved, and although some of them have been unable, from various causes, to bring their work to the stage of full fruition their interest is none the less appreciated.

All the members of the Institute have participated in the work of producing this Report, in varying degrees, but special reference must be made to the share taken by Mr. A. Loose in the more responsible parts, in which his technical knowledge has been of the utmost value. The junior members of the staff deserve credit for the way in which they have persisted in the routine work, without any abatement of energy, in what were, sometimes, rather discouraging circumstances. Four members of the Institute have joined the Army, and the Director records with deep regret the death of Private F. H. Upfold (O. B. L. I.) in action, in France, on July 14, 1916. His brother, Lance-Corpl. S. J. Upfold (O. B. L. I.), was wounded and invalided home at the same time. The Director also desires to place on record the services to the Institute of the late Mr. E. O. R. Wakeman, B.A., St. John's College (Lieut. Grenadier Guards), who was killed in action at Festubert in May 1915. Although no longer a member of the Institute at the time of his taking a commission in the Army, Mr. Wakeman was the first assistant appointed to it when it was started in 1913, and he took an active share in the earlier stages of this part of its work.

OXFORD,
December, 1916.

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CHAPTER I

GENERAL INTRODUCTION

The need for cost analysis in connexion with productive enterprise is one which has grown up gradually with the growth of industry. It has been pointed out that when production was effected by manual labour, either under a more or less primitive factory system, or in a cottage industry, intricate accounting was not required; but the rapid changes in industrial conditions, due to the introduction of labour-saving machinery and the specialization of labour, have led to processes of manufacture so intricate and on such a scale that 'it is only by means of systematic records that leakage, waste, and fraud can be prevented, and that employers can know the cost of any article of their manufacture, and be able to determine accurately and scientifically, not merely approximately and by haphazard, the actual profit they make or loss they sustain, not only on the aggregate transactions during a given period, but also upon each individual transaction. . . . There is always the danger, where only the general result of a business is known, of departments or processes which are relatively unremunerative being unduly fostered, and of those which yield more than the average profit not receiving adequate attention'.[1] Side by side with these results comparisons can be made of the advantages of alternative processes, of the efficiency of different machines, and of various grades of labour, whilst a proper system of record-keeping enables the management to know, from day to day, the stocks of goods and materials on hand as accurately as the cash balance is known, and so to prevent an undue accumulation of capital in unproductive forms.

Thus, scientific book-keeping becomes the keystone of the productive enterprise, upon which the stability of the whole structure of industry depends. Its advantages have received general recognition in all countries where the factory or industrial system has been developed, but in regard to the great industry of agriculture the possibility of a more economic control of production by its means is only very slowly being realized. Agriculture has advanced slowly, but steadily, from the self-sufficing stage, and, although the tendency to promote the greater efficiency of labour by an increase of capital in the form of machinery equipment has been still more gradual,[1] the modern farm approaches daily more nearly, in its organization, to the urban industrial concern. If farming in this country is to hold its own in competition with other forms of enterprise it can only be by the adoption of an organization which will result in a reward to the capitalist and to the worker compatible with that yielded by industrial production, and to do this a study of processes of production and of results, by means of scientific book-keeping, is equally essential on the farm as in the factory. Experience teaches that the problem of the determination of costs in farming is difficult and complex, more so, probably, than in other industries, but it is, none the less, equally important that it should be examined with the same degree of detail and of thoroughness.

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[1] Garcke and Fells, *Factory Accounts*, 6th ed. (1912), p. 5.

The object of this preliminary study is to discuss method, and to show, in certain cases, illustrations of its application. There is, at present, too little agreement among research workers upon questions of principle. In many Continental countries and in America, as well as in Britain, many investigations into agricultural costs have been made[2], and the student of them cannot fail to be impressed with the fact that whereas, obviously, there can be no uniformity of practice in the technicalities of book-keeping processes in all countries, nor, indeed, is any such necessary, there is also no consensus of opinion upon vital matters of method and of principle, upon which all must be agreed if results reliable in themselves and comparable one with another are to be obtained. Thus, the question at issue at this stage is less the production of costs from which generalizations can be drawn than the prior consideration of the determination of points which relate to an exact system of analytical or cost accounting applied to farming.

---

[1] The efficiency of labour employed in agriculture is higher, probably, in the United Kingdom than in any European country. See reference to German agriculture on p. 67.

[2] See Bibliography, p. 121.

Nor is the question under discussion at the moment the consideration of whether such method, or some modification of it, can be adopted for ordinary farm accounts. The question of farm accounts in practice is a matter of marginal utility. In industry it has been the experience of factory managers that it is economical to introduce methods of control which, in themselves, appear to add to the cost of production, and many of those who have made it their business to study the problem of agricultural production are of the opinion that this will be, one day, the experience of farm managers likewise. There is, however, a degree of exactness, required in cost determinations which may be so troublesome, and so expensive of time and labour when judged by the general standard of the business organization of the average farm, that it would not be profitable for the ordinary farmer. But this possibility does not affect the importance of having, in a number of cases, an exhaustive and scientific analysis of farming costs, and if this can be done in a number of typical farms the results will have a value as supplying standards of comparison. In this work the Institute for Research in Agricultural Economics is still at the beginning, and it has not yet reached the stage at which generalizations can be made.

It cannot be stated too plainly, therefore, that it is with the discussion and illustration of the method of scientific analysis of farming costs that this Report is concerned, rather than with the results attained to, so far, by its application. But although information of general application is not yet forthcoming, students of farm economics will realize that a thorough analysis, even of only a few actual cases, based on records carefully and systematically kept, is of interest and value, for it will be admitted that certain comparatively constant factors may be discerned even in a small amount of exact data, while, at the same time, contrasts and variations will be noted which challenge attention.

Further, the analysis of such accounts brings out the need for method even more exact than has yet been found possible. Problems are encountered which call for discussion amongst those interested before satisfactory solutions can be expected, and illustrations of this will be noted in cases which occur where information is lacking which should be available in an exact system of records. (See, for example, pp. 74 and 79.) It is hoped that the discussion and study of these matters will lead to an extension of research work, by means of scientific book-keeping, on the economics of farming, and that it may induce a certain number of farmers who are interested in the thorough examination of their costs of production to undertake, for at least a certain period of time, the recording and analysis of their expenditure by exact methods.

Not only is a standard system of cost analysis essential to the determination of comparative costs in this country, but it is also demanded to enable comparisons to be made between Home costs and those of the Dominions and of foreign countries whose products compete in our markets. In many cases it is their costs, and not our own, which are the determining factor in fixing market prices. In the case of wheat-production, for example, the exploitation of virgin soils, with the aid of railway development and labour-saving machinery, may drive the price of wheat down below cost, through over-production, as was the case in the early nineties, or a partial failure of the crop combined with transport difficulties may lift the price far above that which might be regarded as giving a fair commercial return to the producer, as is the case at the present moment; but in the long run the determining factor is the cost of production in those countries which constitute our main sources of supply, so that accurate information on this point is of vital importance for guidance in the framing of national agricultural policy.

CHAPTER II

DETERMINATION OF METHOD

There are two methods in use for the determination of farming costs, (1) the analytical, (2) the synthetic. The latter is not practised in this country, but certain Continental farm-accountants, particularly Dr. Ernst Laur, advocate its use very warmly as giving certain results with less labour and at less risk of error than are involved in the analytical method. It seems to be especially useful in simple forms of farming, where few products are concerned, and the analytical method is probably more useful in connexion with the highly-developed mixed farms of this country.

It is the analytical method which is pursued in the investigations of the Institute for Research in Agricultural Economics. It is practised with the aid of ordinary double-entry book-keeping, a familiarity with the principles of which on the part of readers of this Report is assumed, and it is based on the compilation of accurate records of the application of capital and labour to food-production on the farm. The results of the analysis of these records entered into account books on the double-entry principle provide the manager with a financial review of the results of his management in all departments.

The first record necessary is that showing the distribution of the capital invested in the farm. In the case of a farm already in operation this will be less a record than an estimation, for the farmer, or other investigator, will have no reliable data of the nature of records from which to compile his figures. An appraisement of the capital laid out in the various branches of the enterprise, and in the means of production must be made, about which more will be found in the following chapter (p. 31).

An important adjunct to the Capital record which is rarely or never met with on the farm, but the value of which is universally recognized in industry, is the Stock Book. This, as its name implies, is a register of the stock-in-hand on the farm, that is to say the dead-stock. As a matter of convenience the larger farm implements and farm machinery are better dealt with apart from the smaller things and the consumable stores of the farm, and a method of recording them is discussed below, but all the small tools and parts of machines, the stores of feeding-stuffs, the artificial manures, sheep-dips, binder-twine, and miscellaneous stores—all of these should be inventoried in the Stock Book at their cost price. Fresh purchases should be debited, and everything given out for use or consumption should be credited in this Stock Book, so that a record is kept of the use of material and of the quantity in stock, and the value of it all at cost price. The book hardly needs any special rulings, or if such appear necessary they will readily be devised to meet individual requirements.

For an implement record and valuation a different form may be suggested for the Stock Book, so as to show the implements and machinery grouped as they are required for the various departments, and with provision for writing off their depreciation annually. All these things must be valued at the outset at cost less depreciation, or if they are new, at cost, and in each succeeding year provision must be made for the depreciation which has occurred through use and age. The usual way of providing for depreciation is to knock off a fixed percentage at the close of the year from the total value when the year began. This is objectionable because it is only a rough approximation, and because the percentage deducted is very often insufficient, particularly in the case of implements bought new. The better plan is to consider each implement by itself and to assign it a life. The depreciation will then be got by dividing the cost or value by the number of years' life. Many tools and implements will always have a certain value, whatever their age, if they are kept in repair, so that it is not always desirable to depreciate the value of an article down to nothing. A 'limit of depreciation' is fixed, and when that figure has been reached no further deduction is made, but the article is carried forward year by year at the same price. To take an example, a set of harrows may be worth 50*s.*, and it will be safe to give them a life of twenty years. This means that 2*s.* 6*d.* per annum must be deducted for depreciation, but if the harrows are kept in repair they will always have a certain value, say 10*s.*, so that after sixteen years, when the harrows will stand in the inventory at 10*s.*, no further depreciation need be allowed.

This may appear for the moment a somewhat complicated and troublesome method of valuation, but by ruling the Inventory Book in the manner shown, the operation becomes a very clear and simple one, whilst it has the great advantage of reasonable accuracy. The value of each group of implements and the depreciation on them in any year become, first, a sum in subtraction and then a sum in addition. Several years can be provided for, but to avoid confusion in the future it must be remembered to leave a considerable space at the end of each group when writing out the Inventory for the first time, to allow for purchases in the coming years. In Table I is given an example of the Implements and Machinery Book.[1]

The next essential is a record of the application of labour, both manual and horse. Time-sheets are used to facilitate its preparation, and these are handed out to the men on pay-day, to be filled up by them and brought back at the close of the week.

The Time-sheet provides space for detailing the work done by the man throughout the week, and for recording the number of horses worked by him on any job. The time should be recorded in hours, for in no other way can anything approaching accuracy be obtained when men are moving from one piece of work to another, at short intervals.

---

[1] From *Farm Accounts*, p. 16 (Cambridge University Press).

TABLE I. EXAMPLE OF

Implement.	Cost (or Value).			Life.	Annual Depreciation.			Limit of Depreciation.		
	£	s.	d.	Years.	£	s.	d.	£	s.	d.
For Horse Labour:										
2 sets brass-mounted harness	6	0	0	12		10	0		10	0
1 set silver-mounted harness	3	3	0	9		7	0		10	0
4 sets cart harness	8	0	0	10		16	0	2	0	0
(And other items										
For Cattle:										
4 18-gallon steel churns	5	0	0	10		10	0	None		
Whitewashing machine	2	0	0	8		5	0	None		
(And other items										
For crops:										
Manure distributor	10	0	0	10	1	0	0	2	0	0
3 1-way ploughs	10	0	0	20		10	0	1	10	0
1 cultivator	5	0	0	20		5	0		5	0
(And other items										
For Poultry:										
2 large lean-to pens	2	0	0	20		2	0	None		
10 black pens	5	0	0	10		10	0	None		
(And other items										
For Dairy:										
Milk float	8	0	0	16		10	0	1	0	0
Milk float	14	0	0	20		14	0	1	0	0
Cooler for milk	4	10	0	20		4	6	None		
(And other items										
For General Use:										
Oil engine	30	0	0	5	6	0	0	10	0	0
Lorry	22	10	0	20	1	2	6	4	0	0
Cart	14	0	0	20		14	0	3	0	0
(And other items										

IMPLEMENT VALUATION

Value in																	
1913.			1914.			1915.			1916.			1917.			1918.		
£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
6	0	0	5	10	0												
3	3	0	2	16	0												
8	0	0	7	4	0												
24	5	10)															
41	8	10															
5	0	0	4	10	0												
2	0	0	1	15	0												
25	2	0)															
32	2	0															
10	0	0	9	0	0												
10	0	0	9	10	0												
5	0	0	4	15	0												
67	12	6)															
92	12	6															
2	0	0	1	18	0												
5	0	0	4	10	0												
23	18	0)															
30	18	0															
8	0	0	7	10	0												
14	0	0	13	6	0												
4	10	0	4	5	6												
159	4	2)															
185	14	2															
30	0	0	24	0	0												
22	10	0	21	7	6												
14	0	0	13	6	0												
118	15	0)															
185	5	0															

Moreover, the greater the minuteness of division, within workable limits, the greater will be the incentive to the men to make their entries carefully and to appreciate the value of time. More commonly, however, it is in days, half-days, and quarter-days that farm labour is recorded.

TABLE II. EXAMPLE OF FARM LABOURER'S TIME-SHEET

OXFORDSHIRE No. 3 FARM

Week ending November 28, 1914. Name, G. Randall

	WORK.	FIELD OR YARD.	HORSES WORKED.	DAY OR PART.
Monday	Ploughing	Wheat	2	1 Day
Tuesday	”	”	”	”
Wednesday	”	”	”	”
Thursday	Ploughing	Oats	2	”
Friday	”	”	”	”
Saturday	Ploughing Looking after	Mangolds Implements	” —	½ ” ½ ”

It is noted by Messrs. Garcke and Fells that to require men to keep simple records of time and materials has been found, in industry, to have a good moral effect and to inspire confidence in the management[1]; and in the rare cases in which the custom of using Time-sheets has been adopted on the farm, a similar good effect has been observed.

As regards crops, the men can record their time either under the name of the crop on which they are engaged ('ploughing for wheat'), or under the name of the crop and also of the field in which it is growing, or is to be grown ('ploughing for wheat, field 43'). Men working with live stock (other than working horses) record their time according to the classification of stock adopted by the farmer for the purposes of cost calculation (for example, 'two hours milking, seven hours with sheep', or 'two hours milking, seven hours preparing food and feeding cows').

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[1] *op. cit.*, p. 9.

When all the Time-sheets have been brought in, the week's work on the farm is transcribed on to one comprehensive Labour-sheet. This can be made to act also as a pay-sheet. Spaces are provided for the names of the workmen, for their employment each day, and for the number of horses, just as on the Time-sheets. Then follow columns to give the number of days worked, and to record not only the cash wages received during the week, but also the weekly value of all allowances and payments in kind. From these figures is calculated the total cost for each man of the week's work, and thus the cost of each man's work per day. The weekly value of the perquisites is arrived at by totalling the value of all the annual allowances, such as free cottages, potatoes, pork, &c. Special payments for lambs, calves, harvest, and so forth are, of course, excluded from this summary and are charged direct, as paid, to the respective accounts concerned with them. Piece-work and overtime, beer-money, &c., on particular jobs are easily included on the Labour-sheets without special provision.

The next record necessarily kept on the farm is that of the live stock, and the foods they consume. The information required is a weekly register of the various classes of live stock, with the numbers of each born and bought, died and sold, or transferred from one class to another during the week; a statement of the foods consumed by each class, and a record of the place where the foods were fed—that is, whether on the land or in yards and buildings. To provide this information clearly and concisely a form has been prepared, and a copy is given as Table IV. Its use is fairly obvious. The only thing, probably, which calls for explanation is the provision of 'Transferred' columns in the Live Stock register. These are to enable the farm accountant to keep track of the interchange of stock between the various classes. Thus, a heifer may be classed for feeding purposes with 'dry' cows one week, but having calved and come into the dairy herd during the week

TABLE III. EXAMPLE OF

OXFORDSHIRE No. 3 FARM.

	Name.	First Day.	Horses.	Second Day.	Horses.	Third Day.	Horses.	Fourth Day.	Horse
1		Ploughing for wheat	2	Same as 1st day	2	Same as 1st day	2	Ploughing for oats	2
2		Same as above	2	Same as above	2	Ploughing for oats	2	Same as 3rd day	2
3		Feeding sheep $\frac{1}{2}$ Feeding cattle $\frac{1}{2}$	1 1	Same as 1st day	1	Looking after cattle	1	Cattle $\frac{3}{4}$ Sheep $\frac{1}{4}$	1 1
4		Helping shepherd all the week							
5		With sheep all the week							
6		Trimming fences all the week							
7		Cowman. Milking, feeding, &c. cattle all the week							
8		Same as above							
9		Helping to milk							
10									
11									
12									

LABOUR-SHEET

and Horses employed in week ended November 28, 1914

ay.	Horses.	Sixth Day.	Horsee.	No. of Days.	Cash paid (Wages and Insurance).	Weekly Value of Allowances.	Total Cost of Labour.	Cost per Day.
					£ s. d.	£ s. d.	£ s. d.	s. d.
as ay	2	½ Ploughing for mangolds ½ Looking after implements	2	6	14 3		14 3	2 4½
ing golds	2	Same as above	2	6	14 3	2 6	16 9	2 9½
le	1	Same as 5th day	1	6	7 0		7 0	1 2
				6	7 0		7 0	1 2
				6	14 3	2 6	16 9	2 9½
				6	12 6	2 6	15 0	2 6
				6½	1 0 3	2 6	1 2 9	3 9½
				6½	1 0 3		1 0 3	3 4½
				6½	6 0		6 0	1 0

TABLE IV. STATEMENT OF STOCK, AND

OXFORDSHIRE NO. 3 FARM.

STOCK.

Class of Stock.	No. at beginning of week.	No. born.	No. bought.	No. transferred in.	Total.	No. died.	No. sold.	Total died and sold.	No. transferred out.	No. at end of week.
Cows	14	—	—	1	15	—	—	—	—	15
Heifers	7	—	—	—	7	—	—	—	1	6
Calves	4	1	—	—	5	—	—	—	—	5
Horses	5	—	—	—	5	—	—	—	—	5
Sheep	100	—	—	—	100	—	—	—	—	100

following the change is noted in the record by an entry against 'cows in milk' in the 'transferred in' column, and by a corresponding one against 'dry cows and heifers in calf' in the 'transferred out' column. The columns provided for the food-consumption record may be filled in either with the actual total weights of food used, or with a statement of the rations being fed; in the latter case the weights must be multiplied out by the farm accountant.

Next, a record must be kept of the application of manures to the various fields, both farmyard and artificial. No special form is required for this record—indeed, a mere note made on the Labour-sheet to the effect that the manure carting recorded on field so-and-so included so many loads, or that the men sowing artificials on such and such a pasture put on so many tons of fertilizer, is an excellent means by which to record these facts to ensure that they will not be overlooked, and the Stock Book (p. 14) will also serve as a record of the distribution of artificial manure.

The only other record needed is one of receipts and pay-

OF FEEDING-STUFFS CONSUMED

Week ended November 28, 1914

Feeding-Stuffs Consumed during Week.									Name of Field or Yard where Consumed.
Soya meal.	Dried grains.	Oats.	Hay.	Turnips.	Chaffed Straw.	Cotton Cake.	Linseed Cake.	Barley.	
lbs.	lbs.	lbs.	cwt.	cwt.	cwt.	lbs.	lbs.	lbs.	
546	136	136	3½	25½	6¼	—	—	—	Yards
—	33	33	4	10½	1¾	33	—	—	Fields
			lbs.	lbs.					
—	—	45	73	14	—	—	31	—	Yards
			cwt						
—	—	420	5	—	2¼	—	—	—	Stables
233	116	—	—	—	1	116	—	233	Swedes

ments. This, of course, is absolutely necessary, and it must include everything bought or sold for the farm, whilst excluding the farmer's private expenses. It is, in fact, a simple but complete cash account.

Nothing else need be required of a farmer co-operating with a research institution in the work of the determination of farming costs, and the necessary information is so easily and simply provided on the special forms suggested, or on some similar forms, that the returns should not occupy more than an hour or so in each week on farms where the number of men employed does not run above, say, a dozen. The objection urged by critics against the system on the score of time and trouble demanded is quite without foundation; the Labour-sheet entails the most work, but this is nearly always reduced from the maximum theoretically required by the fact that a considerable proportion of the men will be found to have been engaged throughout the week on the same piece of work continuously, and one entry only, instead of six, is called for. Thus, however busy a man may be about his farm he cannot sustain the plea of having no time in which to put down the data necessary as a basis for the examination of his business organization.

It is a somewhat different matter when one turns to the analysis and elaboration of the farmer's data, and here, in all probability, he will always require assistance. In the illustrations contained in this Report, this work is undertaken by the Institute. In private practice there is no reason at all why the farmer should not employ his own clerk, or an accountant in the nearest town, or why a group of farmers in one locality should not combine to employ a competent recorder between them. In other businesses of no greater magnitude than that of many farms it is not customary to dispense with all financial records, neither is it common for the head of the business to act as his own accountant, and when farmers begin to assign to bookkeeping something more nearly approaching to its proper place as the only sure means by which to test and control their management, they will not grudge the comparatively trifling expenditure which will be called for in connexion with it. In the meantime there seems to be scope for much educational and research work on the part of those who are interested in the development of farm management, if a joint effort could be made, by which the farmer would provide the data which the student of farm economics would elaborate.

Having now dealt with the general form of the various farm records, a few points still remain for consideration before passing on to the question of analysis. These relate to the classification of the matter comprised in the records, so as to promote the accuracy of the final result. In describing the use of the Labour-sheet it was stated that the record of the application of labour could be made either under the headings of the various crops, or of the various fields (p. 18). This statement calls for some elaboration. In working out the cost of the crops on a farm the most obvious thing is to classify the expenditure of capital and labour under headings (i. e. in accounts) consisting of the names of those crops, and as a matter of fact this is done not infrequently. Thus, the wheat fields constitute one account, the turnip fields another, the pastures a third, and so on, and all items of expense are recorded with a view to their ultimate assembling under these various heads, to give the cost of production in every case. If the whole expenditure necessary to raise each crop began and ended within the year this arrangement could not be bettered, but unfortunately the determination of farming costs is not so simple a matter, and it will be found, in practice, that there are few crops that do not inherit some benefit from their predecessors, or which do not hand on some unexhausted value to their successors, all of which must be recorded. It is not impossible to keep track of such matters in an analysis of labour and of other expenditure based on the crops grown: indeed, examples of this will be found in this Report (see Chapter IV). But a more satisfactory basis is afforded by the fields which grow the crops than by the crops themselves. It may happen that the barley crop of a farm is made up of fields on which it follows a variety of crops, such as roots and clover and wheat; and, in its turn, it may be succeeded by a variety of crops, such as clover, turnips, or a corn crop. Whilst it is not impossible in such a case to obtain a correct figure for the barley cost by means of a record based on work done for the crop as a whole, it will be obvious that the liability to error would be reduced if the basis adopted were one of fields, for, in the absence of absolute uniformity in the rotation, the work of tracing values inherited or transmitted from crop to crop would be facilitated. Moreover, it happens frequently enough that at the time when the year's record-keeping begins the farmer's plans for the coming season's cropping are not definite, or, if arranged, it may be that circumstances unforeseen will compel some alteration in them. Thus, in the year 1913, many fields designed for the root crop on an East Midlands farm were never sown at all, owing to the drought, and the cost of all the workings on them, which would have been mixed up in the 'Roots Account' under a system of record based on crops, was readily transferred to the 'Fallows Account', under a system of field records, when it was found that the fields could not be cropped. Further, field records have a value of their own, for they facilitate the compilation of labour costs, both actual and comparative, and of other results which cannot be arrived at satisfactorily under the alternative system.

In the case of the farm live stock it is of equal importance to secure the proper classification for the records. It is not easy, sometimes, to arrange a division, say, of cattle, most suitable for the accounts which, at the same time, will fit in with the practice of feeding and management on the farm, particularly on small farms. It happens, not infrequently, that classes, the feeding and tending of which should be recorded separately for the purposes of cost determination, are not distinguished by the farmer. Probably his experience will one day confirm that of the manufacturer, and the extra expense necessary for the compilation of complete records will be found to be more than repaid by the information acquired, but at present this stage has not been reached. On the other hand, it is of equal importance not to get involved in unnecessary detail. On a farm where the sole object of the management of the cattle is the production of milk it may fairly be said that the cost of raising calves to supply the herd, and the cost of feeding-off old cows no longer profitable in the dairy, are both of them incidental to the milk production, and one record which includes the cost of feeding and tending calves, dairy cows, and fatting cows is all that is needed where the determination of the cost of milk is the only object.

One other difficulty which arises in the compilation of farm records is due to the partial failure, hitherto, to realize that agriculture is an industry as well as an art. No one would suggest that steel rails should be sold by the heap, or that tiles should be offered by the kiln-ful, yet similar sale units are the rule rather than the exception in agriculture. Hay is sold by the stack, potatoes change hands by the acre, and live stock are bought and sold almost universally by the head. It is no answer to say that to the experienced farmer and dealer these conditions are no obstacle, owing to their ability to determine weights with reasonable accuracy by inspection, for this is not a fact. Last summer a farmer of wide experience and sound judgment sold a stack of hay to a dealer at a price per ton, both of them agreeing as to an estimate of the weight of hay contained. Before delivery was taken the Army Purchasing Officer commandeered the hay, and, buying it by actual weight, the farmer lost about £100 as compared with his first sale. Thus, an experienced farmer, and a dealer who is buying hay every day, both over-estimated the contents of the stack by some 17 tons. Probably dealers are more correct in their estimates, as a rule, than farmers, having greater opportunity for testing their judgments, but this is by the way, and leaving the question of relative loss and gain arising out of this slipshod method of marketing, the point for the moment is that the acquisition of knowledge of farming costs is impossible under it, and this alone should be sufficient to condemn it. In connexion with the analysis of farm records at the Institute it has been found impossible to produce any figures for the cost of meat, or of store cattle, of potatoes, mangolds, or of turnips and the farmer will continue to be at a serious disadvantage in the development of his work until this disability is removed. The hope may be expressed that other research institutions equipped with farms of their own will take up the investigation of costs, so that these blanks in farmers' records may be filled.

With the records of the distribution of capital, of the expenditure of labour, of sales and purchases, and of the weight of products realized, all noted in a form as complete as may be, the work of analysis next calls for consideration. The Labour-sheet figures are transferred to an Analysis-sheet, a copy of which is printed here as Table V. It is little more than a number of money columns, each set headed with the title of the accounts or departments of the farm. At the beginning are columns, referring to the Labour-sheet, for entering the men's numbers and rates of

TABLE V. EXAMPLE OF FARM LABOU

OXFORDSHIRE No. 3 FAR

Account :—			Wheat, 1915.					Oats, 1915.					Mangolds, 1915.					Cattle.			
Man's No.	Rate s.	d.	Dys.	£	s.	d.	Hor.	Dys.	£	s.	d.	Hor.	Dys.	£	s.	d.	Hor.	Dys.	£	s.	d.
Bt. forward																					
1	2	4½	3		7	1½	6	2		4	9	4	½		1	2	1				
2	2	9½	2		5	7	4	2		5	7	4	1½		4	2½	3				
3	1	2																4¾		5	6½
4	1	2																			
5	2	9½																			
6	2	6																			
7	3	9½																6½	1	2	9
8	3	4½																6½	1	0	3
9	1	0																6½		6	0
10																					
11			5		12	8½	10	4		10	4	8	2		5	4½	4	24¼	2	14	6½

pay, and then, by inspection of their work during the week as recorded on the Labour-sheet, an analysis is made, and the work in the different departments is priced. The cost of the horse labour cannot be determined until the end of the year, when the cost of keeping the horses is known, so that the record of days of horse-work begun in the Labour-sheet is continued also in the Analysis-sheet, a column headed 'Horses' being attached to each set of money columns for the purpose. The horse-days in each department are cast up week by week, and by dividing the total number of days at the end of the year into the total cost of keeping the horses, the cost of a horse-day is found. The accuracy of the analysis of labour can be checked by casting the columns both ways and comparing the totals with those in

ALYSIS-SHEET

abour Analysis for week ended November 28, 1914

Sheep.				Establishment					Implements.					Total.	Total Cost.		
£	s.	d.	Hor	Dys.	£	s.	d.	Hor.	Dys.	£	s.	d.	Hor.	Dys.	£	s.	d.
									½		1	2½		6		14	3
									½		1	4½		6		16	9
	1	5½	1¼											6		7	0
	7	0												6		7	0
	16	9												6		16	9
				6		15	0							6		15	0
														6½	1	2	9
														6½	1	0	3
														6½		6	0
1	5	2½	1¼	6		15	0		1		2	7		55½	6	5	9

e Labour-sheet, and at periodical times, either weekly, onthly, or quarterly, the labour costs are posted to the partmental ledger accounts.

Coming to the Live Stock and Foods record, all foods are bited as bought, in the first instance, to a Foods account, d then by means of the food-consumption record the antities and prices of bought foods are worked out, and so the value of the food-residues as given in Voelcker and all's Tables. Thus, the charge against the stock is arrived , and also that against the manure. It is in this connexion at the value arises of the record of the place where conmed, i. e. 'field or yard'. If consumed on the field, the lue of the residue is charged against that field; if conmed in yards, the value is charged against the farmyard manure account. Home-grown foods are priced at their cost to the farmer.[1] Sometimes the cost cannot be determined until the end of the year, and then it is only necessary to calculate weights, and carry these on until prices can be assigned to them. Skill can be exercised in avoiding unnecessary calculations. For example, although it is very desirable to be able to work out the cost of growing a ton of turnips it is not necessary to try to estimate the weight of roots consumed by sheep folded on turnips, and to multiply it out, week by week, by the number of head, and then to price it at the cost per ton. If the sheep consume the whole of the crop, or the whole of the crop in any particular field or fields, it will be necessary only to refer to the cost of the whole crop, as worked out in the field accounts in the ledger, or of that part consumed by the sheep, and then to charge it against them by one entry. Analytical accounting makes sufficient work without the undertaking of more than that which will be productive of useful knowledge.

The analysis of other cash payments involves no special machinery. Tradesmen's bills can be split up in the cash-book, where necessary, and the component parts carried to the respective departmental accounts. Or, in particular cases, as for example, bought manures, it may be more convenient to debit a ledger account with the whole item and charge it out by piecemeal with the aid of the Stock Book.

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[1] This involves a question of principle which is discussed on p. 36.

CHAPTER III

QUESTIONS OF PRINCIPLE

In view of the probability of an extension of the work of investigating farming costs it is very important to secure uniformity of method and general agreement on certain questions of principle, so far as is possible. In no other way can a proper basis of comparison be established, and standard results achieved. Reference has been made already to the wide divergences of opinion on vital questions exhibited in the work of Continental and American investigators, and an effort should be made, while this field of research is still practically unexplored in this country, to bring about a general agreement on essentials. In this chapter some of these points are raised, less, it should be remarked, with the object of answering them than with that of initiating the consideration and discussion of them.

Valuation. In making farm valuations the basis must be, in every case, the cost of production of the matter concerned. Under no circumstances must the market price be allowed to exert any influence, or serious misconceptions may result. The worth of any article to the farmer is the price it has cost him to produce, and the time to introduce the market value into the account is at the moment when it is sold, and not until then, so that the farmer may be in a position to make a comparison between the value to him, as shown by his books, and the value on the market as shown by the price realized. Thus he is able at once to appreciate the results of his management. If market values are introduced at intermediate stages in the process of production the whole basis of comparison is lost, and thus the farmer is deprived of the only reliable means by which to estimate the success of his policy, and by which to determine his future actions.

The common practice of basing farm valuations upon market prices is another illustration of the misconception of facts which may arise, in connexion with farm management, owing to the absence of proper records. A valuation of live and dead stock and of tenant-right may be needed, and there are no figures on the farm from which to extract it. An inventory is easily made, and when it becomes necessary to assign a price to each of the articles composing it the obvious and natural thing is to apply the only known values, namely, those current at the time in the market, regardless of the fact that these represent that which the articles are worth to other people rather than their value to the individual most concerned. Indeed, in the absence of accounts it is almost impossible to make a valuation except on the basis of market prices, for these, at least, can be ascertained and applied, whereas there is nothing to indicate to the farmer what his outlay has been on the various subjects of the valuation. Where an adequate system of records exists, the process of valuation is quite mechanical. The departmental accounts will show, at the moment when the valuation is to be made, the cost of every item at that date, and this cost is the measure of their value to the farmer. If the cost proves subsequently to be above the market value, the farmer makes a loss on his product; if it be below the market price he makes a profit. In the former case he will review the figures, and the circumstances attending the production, to determine whether the loss is due to causes beyond his control which are not likely to recur, or whether the probability of a repetition makes it undesirable to continue along this particular line; in the latter case he can contrast one profitable venture with another with the object of narrowing down his system of management, so far as possible, so as to concentrate his efforts on those which are most profitable with a view to developing them still further. Judging from the experience gained on those farms from which records are sent regularly to the Institute for analysis, there must be many holdings on which capital and labour are being employed unprofitably in one or more directions owing to the absence of any system of valuation by which the farmer can compare his costs with the realized price.

In all farm valuations, then, the basis must be the cost price, but it must be noted that the application of the principle raises certain problems which call for further consideration and discussion amongst investigators before it can be assumed that the most satisfactory solutions have been found. What, for example, is the cost of a new-born animal? In the case of a foal it might be said to represent the stud fee and the cost of food and attendance for the mare for the period during which she was not at work up to the birth of the foal, but in the case of calves and lambs even this rather doubtful estimate cannot be made. At the Institute the practice is to assume a value dependent on circumstances for the new-born animal whatever it may be, and it is difficult to see how a more scientific basis can be established.

Starting with this assumed value it is a fairly easy matter to calculate the cost of the young animal, year by year, until it is sold as a store, or fat to the butcher, until it is taken into the breeding stud, herd, or flock, or until, in the case of horses, it is sold or put to work on the farm. Those animals retained on the farm for breeding purposes or for work should be valued thereafter at the total cost of bringing them up to that stage, and no more. Thus, if a heifer has cost £18 to keep up to the time of her first calf, she will be valued so long as she remains in the herd at this figure, and a young horse that has cost £35 up to the time when it is broken for work will stand in the books at this price thereafter. These are the sums that it has cost the farmer to bring these animals to a productive stage. The further expense of maintaining them year by year is not an addition to the cost of the animals, but represents the value, to the farmer, of their produce; whether it be work done, as in the case of horses; milk and calves, as in the case of cattle; or lambs and wool, as in the case of sheep. Thus, the breeding animals on a farm and the working horses which have reached the productive stage, are valued year by year at a constant figure of so much per head, representing their cost to the farmer at that stage. A little experience will tell the farmer what that cost is, under normal circumstances, and will enable him to apply an average figure to all animals in the same category. Under no circumstances whatever must the market value at the date of the valuation be allowed to obtrude itself. To introduce market values robs the figures entirely of their use, for it is impossible, thereafter, for the farmer to make the comparison necessary from time to time to decide him in the matter of the sale or retention of any individual or group of individuals in his flocks and herds. With their costs before him a familiarity with the trend of the market will enable him to consider the advantages of either course, but once let the true facts of his own experience, as revealed in his books, give place to values assigned by others as applicable to their own cases, and all basis for the comparison is lost.

Moreover, valuation of live stock on the basis of market values at the time will confuse the farmer by the introduction of paper profits and paper losses into his results. Farm management is not subject, usually, to violent or sudden changes, whereas markets are apt to experience considerable fluctuations. In the case of breeding stock, particularly, which is not shortly to be realized the fluctuations of the market may bring about startling results. A shortage of keep at home, or the closing of foreign ports, may bring about a fall in prices sufficient to turn a profitable year into one, apparently, of serious loss if these prices are employed as a basis for the valuation of stock which is not for sale; similarly, a temporary inflation of values from any cause might lead the farmer to unwarranted optimism regarding his financial position. It follows that no account must be taken of 'pedigree' value. Pedigree value is essentially a market value, not a cost value, and anything may happen to make it of no value at all. A colt with a pedigree back to *Eclipse* may prove of no more worth than to pull a greengrocer's cart; a heifer with a splendid milk pedigree proves, not infrequently, to be of no special value at the pail, and even though it be otherwise, an accident, or an outbreak of disease, may wipe off the whole of the value due to long pedigree in a few minutes. There must be no departure under any circumstances from the principle of valuation at the cost of production; on no other basis will the farmer's accounts act as an index of the success or otherwise of his management.

In the case of *purchased* pedigree stock the principles laid down here seem to contradict themselves, in that if the cost to the farmer is to be followed then pedigree value must be recognized. The difficulty is more apparent than real, for in purchasing pedigree stock the farmer is really buying two things, and the purchase price is resolvable into two parts: (1) the cost of the animal as one of its class; (2) its additional value, present and potential, arising from its pedigree. Having regard to the disparity in the prices paid for pedigree as compared with ordinary or market stock, not only is it the right course, but as a matter of prudence it is the necessary course, to split the total value, as marked by price, into the value of the animal as stock of normal class at ordinary cost, and its additional value as stock of an abnormal or pedigree class. The former value will be charged against the particular live stock account to which the animal properly belongs, and the latter value will be debited to a 'Pedigree-value' account. If the purchased pedigree stock is retained for service on the farm, and is thus decreasing in value, a proportionate part of the pedigree value should be written off each year. If the animal is sold at any time at less than the combined values at which it appears in the ordinary stock account and in the Pedigree-value account, the amount of the deficiency should also be written off in the year's Profit and Loss account, and similarly, if a higher price than the combined values were realized the difference would be treated as profit. If by disease or accident the value of purchased pedigree stock is reduced, the Pedigree-value account should be reduced to correspond, or should be entirely written off if necessary.[1]

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[1] A Pedigree-value account has some analogy to Goodwill account, though

Valuation of Intermediate Products. The need for accurate analytical accounting is evidenced in nothing, perhaps, so much as in the confusion of thought which prevails on the question of the valuation of the intermediate products of the farm, the hay, straw, roots, pasturage, &c., produced for home consumption in the process of manufacturing milk and meat. There is only one possible basis of value, namely, the cost to the farmer, but, just as in other valuations, the fact that there are no records of cost drives the farmer to use other comparisons, and the market value, or in rare cases a scientific unit, such as the starch equivalent, is substituted for the sum which the farmer has actually paid.[1] As a matter of fact, the bulky feeding-stuffs usually produced and consumed at home rarely have any market value at all. A market value is one that can be realized in the market. Thus wheat, beef, and other commodities have clearly market value because they are always saleable, but if all the farmers in the country decided to sell their mangolds they would find that the market for mangolds is non-existent, and that the prices quoted in market reports represent a few deals to satisfy an infinitesimal demand. The same is true of straw, and in a slightly less degree of hay.

Even if the difficulty of fixing the market prices of certain products, such as turnips, or even hay, be ignored, and if it be assumed that there is a free market in such things, a fuller consideration of what the farmer really does in feeding them to his stock will show how inapplicable such values are to his case. The market value of an article is the figure at which a willing buyer and a willing seller can agree to do business. The farmer who contends that he is justified in

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it is suggested that a closer comparison could be established with Patent Rights account as being exposed to greater vicissitude than Goodwill.

[1] Since this was written the controversy in the newspapers upon the increased cost of food-production has shown how universal is this misconception of facts. All the writers make such assertions as that their horse labour costs them double what it did, because oats are selling for twice as much as they used to do, or that the fact that hay has doubled in price makes the milk their cows produce so much the more costly. This is as much as to say that if a man buys a 4 per cent. stock at 50, and it rises subsequently to par, he is only getting 4 per cent. on his money.

'selling' his roots or hay to his stock is selling them, in point of fact, to himself, and seeing that there is only one party to the transaction there can be no market, and consequently no market price. In the majority of cases each of these things is grown because the farmer has need of them in the production of the article or articles of food towards which his management is directed. If he could buy them more cheaply than he can grow them he would surely do so, but to regard himself as a merchant instead of as a manufacturer, and then to trade with one department of his farm against another is to involve himself in paper transactions which have no foundation in fact, and which may lead to disastrous conclusions. Some years ago a well-known firm of manure manufacturers found themselves handicapped in the production of superphosphate by the high price of sulphuric acid. To meet this they decided to put down a sulphuric acid plant, and found that the cost of their 'super' was immediately reduced. Had they followed the principle of valuing the acid at its market value their superphosphate would still have appeared to be an unproductive line, and the only conclusion to be drawn from their books would have been that they should give up manure manufacturing and concentrate their efforts on the production of acid. The same argument holds good in the case, so often quoted, of the price of hay and the cost of milk. It may well be that in consequence of a temporary or of a local demand it will pay a farmer better to sell hay rather than to produce milk, and one of the main functions of book-keeping is to enable him to make a decision on such points as this. But he cannot expect to have it both ways; if he sells hay he cannot produce milk, and vice versa. Many farmers contract at summer prices for their winter's supply of feeding-stuffs, but a man who has bought linseed cake at a pound per ton less than the market price at the time when he is consuming it would hardly think of charging it to bullocks at any other price than that which he actually paid, and it is this figure, the actual cost to him, which must be the measure of the value of *all* intermediate products, whether they be bought in the market, or whether, for the sake of convenience and economy, they be grown on the farm.

The mistake of valuing crops consumed on the farm at their supposed market value instead of at cost price is so generally made[1] as to call for the fullest discussion and consideration by those engaged in cost determinations. It arises partly, no doubt, from a want of clear thinking on the subject of what is the cost of an article, but mainly from the lack of records on the farm. In the absence of information as to what he has paid for his hay or for his roots in the process of production the farmer turns once again to the market in order to fix their value, and the market price of hay at the present time, when a crop costing probably some 50*s.* per ton to produce will sell readily for £5, is an indication of the magnitude of the error which this system of valuation may introduce.

A difficulty which presents itself in this connexion is that of how to value the parts of a crop produced simultaneously by the same expenditure of capital and labour, but used separately. For example, how is the cost of a wheat crop to be divided between the grain and the straw? At the Institute the practice has been to base this division upon a comparison of the market values of the two products, the justification for this course being that in a prairie country, where the straw is usually burnt, as being worthless, the whole cost of the crop will be borne by the corn, and if it be possible to find a locality, or a crop (flax is sometimes a case in point) where the straw alone is utilized, the total cost would be chargeable against the straw. Between these extremes the cost is shared between the two commodities according to their relative market values. The objection to this principle lies in the fact that one of the components may have no real market value, and the division of cost would then have an unsubstantial basis. This is certainly likely to be the case with barley and barley straw, as there is no market in the latter. Perhaps a more reliable division could be found, based on a comparison of the food values of the two parts of the crop. In the illustration given in Table XXXVI, where a total crop-cost of £5 6*s.* 10*d.* per acre was incurred on the East Midland farm to produce 3·9 quarters of barley and 15 cwt. of barley straw, a division has been made on the basis of a market value of £2 per quarter for barley and £1 per ton for the straw. This brings the cost of growing the barley to £1 4*s.* 6*d.* per quarter, and of the straw to 14*s.* 5*d.* per ton. If the comparison were to be made on the basis of feeding value, calculated by the starch equivalent method of Kellner, the cost of the corn would be about 18*s.* per quarter and of the straw about 47*s.* per ton, regarding the former as a production food, and the latter as a maintenance food, or about 21*s.* per quarter and 28*s.* per ton if both are regarded as production foods. These divergences suggest an urgent need for further consideration on the part of those engaged in cost investigation.

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[1] See, for example, G. F. Warren in *Farm Management*, p. 55, where he refers to the 'absurd practice of some institutions of charging feed to animals at the cost of producing it rather than what it can be sold for, less the cost of marketing'.

The Cost of Horse Labour. Where the farm horses are regarded solely as a source of motive power no difficulties in principle are involved. The animals are valued at their cost price, whether bred or bought, and the difference in this figure, year by year, added to or subtracted from the expense of feeding or otherwise maintaining the horses, represents the cost of their work for the year. No special calculation or estimate of depreciation has to be made, as the breeding or buying-in of the young horses and the death or sale of the old ones supplies automatically the exact measure of this item, by difference, in the account. The case is otherwise, however, where the farmer is in business as a breeder of horses for sale, or as a dealer. These are businesses quite distinct from the performance of horse labour, and special provision is necessary to prevent the partial obscuration of the actual cost of horse labour. This is made by having two accounts for horses, a 'Stock' account and a 'Working' account. The stock account is simply a debtor and creditor account of horses on hand, bred, bought and sold, together with the cost of feeding and maintaining brood mares and young stock not at work on the farm. The balance represents the farmer's profit or loss on his year's breeding or dealing. The working account is composed solely of the cost of maintaining those horses which are worked on the farm. Maintenance includes food, shoeing, &c., and also a charge for depreciation debited to this account, and credited to the stock account for the use, so to speak, of the working horses. Even though the horses be all of them young ones, appreciating in value instead of depreciating, this charge must be made, otherwise the profit due to the farmer for his skill in the management of his horse stock will not appear as such, but will go fictitiously to reduce the cost of the horse work. Obviously the cost of ploughing an acre should be the same whether performed by young horses or old ones, other things being equal. The actual amount to be charged for depreciation depends upon the cost of the horse stock and their effective life duration. For example, the depreciation of horses costing £40 at the date of coming into use on the farm, with an estimated effective life of twenty years, is £2 per annum.

Manurial and Food Residues. In calculating the value of these items the basis, once again, must be the cost. The principle is to take the initial food cost, and to depreciate it according to the methods laid down, in the first place, by Lawes and Gilbert, and revised, subsequently, on two occasions, by Voelcker and Hall. The fact that the conditions of making and storing farmyard manure, and that the influence of atmospheric and soil conditions upon the effect and duration of it and of artificial manures may produce wide differences in their action is inevitable, but no better method has been devised. It may be noted that whereas in an outgoing valuation the valuer for the landlord (or incomer) may justifiably claim to substitute the price at which the manures or foods could have been purchased for that at which they were actually bought, and this, indeed, is commonly done, the farmer keeping records of his transactions must not depart from his own experience, but must start from the actual cost to him of the materials concerned, however disadvantageously they may have been acquired.

The distribution of the cost of cleaning land. The fact that the effect of certain manures endures beyond the removal of the crop to which they have been applied has long received recognition, not only in theory but also in practice, for it is the custom of agricultural valuers to allow two years before the residues from purchased foods are held to be exhausted, whilst to certain manures an even longer duration of effect is allowed. In the same way the duration of other improvements beyond the year in which they are effected is recognized. These matters afford a precedent for an attempt to distribute the cost of cleaning the land as performed at the time of fallowing, or before and during the growth of the root crop, over all the crops which intervene until this operation falls due to be done again. The simplest case is that of the bare fallow. The land has grown a rotation of crops, ending with a corn crop, and it is too dirty to be cropped again until it has been fallowed. Whether this be cheap or costly will depend very largely upon the season, but wet or fine there will be a considerable expenditure of labour and a year's rent and rates from which the farmer will reap no return in the form of a crop. It is not unusual to put all this outlay to the charge of the following wheat crop, and the cost of 'wheat after bare fallow' may amount to a very large figure in an outgoing valuation. As a matter of fact it is not justifiable to look upon the fallowing expenses as the cost of work necessary to grow the wheat crop alone, for all the crops in the rotation will benefit by it, and a division of the total cost must be made between all the crops accordingly. The same case arises when fallow crops replace the bare fallow in the system of management, with the difference that here a distinction must be drawn between work done as necessary to secure the crop, and that which is performed only to clean the land.

In either case a certain figure is found which represents the cost of cleaning the land for the next succession of crops. As to the division of the cost between them, only an arbitrary basis has been found possible hitherto. The charge may be divided equally between the crops, that is to say, in a four-course rotation 75 per cent. of the cleaning cost would be carried forward from the first crop, 50 per cent. from the second, 25 per cent. from the third, and nothing from the fourth. But it may be argued that the first crop will derive a much larger benefit from the cleaning operations than the subsequent ones, and the basis of distribution adopted at the Institute, and employed in the illustrations of farming costs appended, is that of charging 50 per cent. of the total cleaning cost to the first crop, 50 per cent. of the remainder (i. e. 25 per cent. of the total) to the second crop, and to divide the residue equally between the last two crops (i. e. 12½ per cent. each). By experiment upon the farm it would be a fairly simple matter to determine the actual respective shares of each crop in the rotation in the cleaning benefit; in the absence of this information the second of the above proposals may possibly be regarded as the best division that can be effected.

It may be pointed out that the necessity for apportioning the cost of this work is quite independent of its actual advantage to the land. After a wet and difficult season, which leaves the land almost as dirty as it was at the beginning, a tenant-right valuer may well contend that nothing is due to an outgoing tenant under this head, on the ground that no benefit to the incomer has accrued from the work. But this argument does not concern the farmer who is farming by his books and to whom a knowledge of costs is essential; once more it is the cost incurred that he must know, and the value, or otherwise, of the work will be revealed when he comes to market the crops, a part of the charge of which is represented by the expenditure upon the attempt to clean the land which grew them.

In connexion with the root crop it is a question whether rent and rates ought not to be included with the unexhausted cleaning costs, and carried forward for distribution over the rotation. This, of course, is what is done where land is bare-fallowed; and having regard to the nature of the root crop, that is to say, that it is a crop introduced, in the main, to make the bare fallow less of a dead loss, it might be proper to relieve it of this charge, or anyhow of some part of it. This is one of the many questions calling for consideration by those engaged in this work. In the meantime the practice at the Institute is to include rent and rates in the cost of the roots.

The distribution of On-cost and Establishment Charges. No matter how carefully the analysis and distribution of expenses may be effected, there will always be certain items which cannot be apportioned or assigned directly to any account. Such matters as the foreman's or bailiff's wages, repair of roads, &c.; keep of the farmer's nag-horses or motor, these and similar things are part of the cost of production, but they cannot be allocated at the time of payment to any department or departments. At one time it was not customary, in industry, to take account of these things in cost determinations, but they were carried to the debit of the profit and loss account. It is now almost universally recognized that, although this method had simplicity in its favour, 'an efficient check upon the indirect expenses can only be obtained by establishing a relation between the direct and indirect expenses',[1] and the indirect expenses are collected into an account the balance of which is distributed over the accounts of the productive branches of the enterprise. The basis of the distribution is various. In some concerns this balance is divided in proportion to the amount expended on labour, or on the materials; in others, in proportion to the labour and materials; in others, again, where the quality of the labour may vary very much in different branches, and with it the amount paid in wages, the time during which the labour is employed is adopted as the basis rather than the amount of wages. In farming the fluctuations in the quality of labour or in materials used in the departments of the farm is very slight, and the principle of distribution of general expenses adopted in the examples given later in this Report is that of a percentage on the labour and materials, the assumption being that the department which has had the greatest expenditure in it of labour and materials has benefited to the greatest extent by the general expenditure.

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[1] Garcke and Fells, *op. cit.*, p. 89.

On the farm Establishment expenses as distinguished from On-cost are very few. Clerical assistance employed is usually *nil*, and not infrequently there is scarcely any other item of any magnitude. Messrs. Garcke and Fells point out that whereas establishment expenses are most certainly elements in the cost of production, yet in industry they are more properly left out of calculations of cost price. 'A large increase in the value of orders received would not necessitate a like augmentation of the office staff, nor would a sudden and serious falling-off in trade enable a firm to effect an immediate or proportionate reduction of general expenditure.'[1] In agriculture, however, there is not this dependence upon orders, and the fluctuations in manufacturing costs due to the changes in the cost of labour and the prices of materials are also very little felt in normal times. Thus, there is not the objection to the inclusion of establishment charges in the cost price of the farm products which arises in the factory, and on-cost and general establishment expenses may well be included in one account in the books, and distributed together over the productive branches of the farm. Only the productive accounts are concerned in this apportionment, because the balances of all other accounts are themselves distributed in due course.

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[1] *op. cit.*, p. 93.

CHAPTER IV

ANALYSIS OF RECORDS OF FARMING COSTS IN 1915

SHORTLY after the establishment of the Institute at Oxford, a public offer was made by the Director, on the occasion of a meeting of the London Farmers' Club, to furnish a set of cost accounts to any member who would supply certain records of income and expenditure on his farm throughout the year. The obligation was to be a mutual one; farmers were to receive a full statement of the cost of producing the various articles constituting their output, together with a profit and loss account of their whole enterprise, and the Institute was to be allowed to use the information gained for statistical purposes. A guarantee that the farmer's confidence would be respected was to be given in every case, and no information of a personal nature was to be utilized in such a manner as would be likely to lead to the identification of the individual supplying it. This invitation to farmers to co-operate with the Institute was advertised throughout the country by the agricultural and local press, but there was practically no response. Accordingly, it was decided to call upon selected farmers with a view to interesting them in the scheme, and, in the result, a sufficient number were quickly met with to keep the small staff of the Institute very fully occupied in the work of analysing the records kept by them. Unfortunately it was impossible to arrange for any help or supervision to be given to the farmers in the early stages of the work, and this operated against the compilation of results in two ways. In the first place, it meant that errors and omissions in the returns sometimes went undetected until too late to rectify or to supply them; in the second place, it was impossible to apply the stimulus necessary, in certain cases, to carry a man through twelve months of record-keeping before tangible proofs could be given of the value to him of the work. Thus, in the one case, a first year's results have sometimes proved too unreliable to have any value for the purposes in view, whilst, in the other case, nearly twelve months of arduous work at the Institute have been completely wasted because the farmer has allowed the work at his end to lapse before the completion of the agricultural year. In common with other research stations the Institute has found its difficulties augmented in no small degree by the Great War, for not only has the staff been much disorganized by the removal for active service of members familiar with the work, but others have had to be found and trained. The labour difficulty on farms, together with the departure, in certain cases, of sons and pupils by whom the work of record-keeping was largely performed, has closed several accounts which promised to be of interest and value, and the many months of work spent on them has been consequently to a large extent wasted. One farmer, who displayed the greatest interest in the work, and whose records were probably among the most reliable of those received at the Institute, has himself made the great sacrifice. The fact that new collaborators among farmers have been found does not entirely meet the difficulty, because the value of the results is largely dependent on the continuity of the records.

Thus it will be seen that the difficulty, which had been fully anticipated, of obtaining the collaboration of farmers in work so uncongenial and so little appreciated as book-keeping, has been supplemented in no small degree in a manner quite unexpected. But, at the same time, the experience derived makes it abundantly clear that, given sufficient assistance to allow the work of analysing the farmers' records to be carried out accurately and at speed, whilst providing also for a certain amount of overlooking by the Institute of the work at the farmer's end, interest in the investigation of the cost of production could be extensively developed, and valuable results on a large scale might be obtained.

A. Description of the Farms

Records were received during 1915 from twenty farms in England and Scotland. To get the best results from this work on the cost of production it would be desirable to select typical farming districts and to obtain the collaboration of, say, some half-dozen farmers in each, occupying fairly representative holdings. This should lead to the compilation of reliable averages, and it would be possible to speak with considerable confidence as to the farming costs in any district in any year, and many valuable comparisons could be made, both between district and district, and between farm and farm. This was the intention at the outset of the work, but it was found to be impossible of realization at the time. In the first place, the resources of the Institute would not admit of an attempt to deal with more than two or three districts; in the second, an insufficient number of representative farmers were forthcoming in each of those districts in which their collaboration was sought. Thus it happened that help was sought here and there where it was likely to be obtained, regardless of the district. There is no reason to suppose that this state of affairs must necessarily continue; the value of all work is best judged by the results, and in the absence of any examples of the utility of the proposals made to the farmers it is not altogether surprising if many of those to whose notice they were brought did not immediately grasp their purport and advantage.

As to the farms on which the work was done, as recorded in this Report, all of them are in the occupation of men farming for their living, or as an investment; pleasure farms have been rigorously excluded. They lie scattered widely over the country, but it is possible, nevertheless, to group them roughly together for purposes of comparison.

Dairying Farms

Midlands No. 1. This holding is rather more than one-half in grass. The arable land is managed on a five-course system, slightly upset by the growing of a good many potatoes in recent years. The root-land is cropped mostly to supply cow-keep, the only live stock, except for a small flying-flock of ewes, being a large dairy herd milked for a neighbouring industrial town.

Midlands No. 2. This is a typical suburban farm, lying on the outskirts of a large manufacturing town. The soil is light and hungry, and the holding is more or less evenly divided between grass and arable land. A fair quantity of potatoes are grown, but otherwise the farm may be said to be managed entirely for the production of milk. Labour costs are very high, in fact, men are only to be got in direct competition with industry, and all those not employed on piece-work are paid by the hour. The splendid market compensates for these adverse conditions, however, and the highly paid labour appears to be very efficient.

South Midlands No. 1. This is a large farm where equipment and management have been carried to a high degree of excellence. The soil varies, including almost every type, and calling for varied styles of management. A very fine herd of dairy shorthorns is the most important feature amongst the live stock, but on the lighter soils sheep-farming is carried on. Up to the present, figures for the earnings of the farm labourers of all grades are the only statistics available from this holding, but so soon as the work of keeping the necessary records is better understood and practised, it should furnish most valuable data for almost every branch of farming in this locality.

South Midlands No. 2 is a light-land farm situated in an arable district, and consisting of arable and grass land in almost equal proportions. Milk is sent to London, and milk, sheep, and barley are the principal objects of the management. Labour is normally plentiful and low-paid, and the cost of milk-production on this farm makes an interesting comparison with that on the Midlands No. 2 farm, described above, where all the conditions are dissimilar.

South-Eastern No. 1. A small farm of the suburban type given up to milk-production for a local residential town. Owing to the death of the tenant, in action, the records ceased before reaching the stage at which they should have afforded reliable information, except as regards the earnings of labour.

South of Scotland No. 1. This farm may be included among the dairy holdings, its principal product being cheese; it is about one-third arable and two-thirds grass. The soils vary from a brashy loam to clay, and they are rather difficult to work. The manufacture of cheese makes pig-keeping on a fairly extensive scale possible, and sheep are also kept.

South of Scotland No. 2. A fairly large mixed dairy, arable, and stock farm. The soil is generally a useful loam, becoming rather stony in parts and frequently near the rock. The principal form of produce is cheese, for which the place is noted. Enough is ploughed to keep a large herd of cows in straw, hay, and roots, while young cattle and sheep are kept. The greater part of the farm is under grass and on this basic slag is generously used.

South of Scotland No. 3. This is a dairy, arable, and stock farm. The soil is a mixed loam, varying from what is almost clay to a light gravelly loam. Milk is the dairy produce, a large herd of cows being kept. A number of bullocks and sheep are fattened, horses are bred, and a considerable quantity of oats is sold.

West of Scotland No. 1. A mixed dairy, arable, and pasture farm. The soil varies a good deal, running from gravelly loam to clay. Most of the land is sheep land. Heifers are reared for sale as well as for making up the milk herd, and most of the cropping is carried out to provide the cows and young stock with winter food.

Corn and Meat Farms

Eastern Counties No. 1. This is a large holding, about five-eighths arable and three-eighths grass, which is mainly a corn and stock-raising farm. After one year's labour figures had been recorded the work unfortunately had to be stopped, on account of clerical difficulties arising out of the war, and no results, except such as relate to the earnings of farm workers, could be produced.

Eastern Counties No. 2. Is a farm almost entirely arable land. The soil generally may be described as a light, sandy loam, varying slightly from field to field from light sand to loam. The small area of grass land is situated mostly on chalky boulder clay. The main feature of the management is corn-growing, the corn being largely sold for seed in the neighbourhood. A four-course rotation is followed, or sometimes a five-course, a barley crop following the wheat as the last crop in the rotation. All the mangolds and half the swedes are fed to fattening bullocks, the remainder of the swedes being consumed on the land by sheep. For profit the management looks to the corn crop, the live stock being regarded more as manure-making machines.

East Midlands Nos. 1 and 2. These two farms lie close together and are under the same control. They are about one-third grass and two-thirds arable. The soil is for the most part light, and easily worked, and the four-course rotation is practised. Corn, especially barley, and stock-raising may be said to constitute the principal objects of the management, but a considerable dairy herd is maintained for the production of butter. There is no little resemblance between the conditions prevailing on these farms and on South Midlands No. 2, but the great distance from the railway of the East Midlands farms makes it impossible to develop the dairying side to the same extent.

South-Eastern No. 2. Here is a fairly typical East Kent hop farm, one-third of the land being arable, of which one-third again is hops, this being the best portion of the farm. Except for the hop-land, the arable is mostly thin, lying quite close to the chalk, and it is cropped on a five-course rotation, oats following barley, and seeds being sown in the oats. Of the grass-land, less than one-half is good old pasture, the remainder being down-land. As is often the case with a hop farm, the hops get most of the manure, and 'have to stand god-father to everything else'. The upland grass is grazed entirely with sheep, and cattle-raising for beef-production completes the scheme of management. Good hops, good barley, and good beef may be taken as a summary of the output of this holding.

South-Eastern No. 3. A mixed farm in a district somewhat remote, consisting of one-third arable and two-thirds grass. The soil varies from a light chalky loam to a fairly heavy clay loam. About half the grass is rough down-land, but most of the remainder is good pasture. The management is chiefly directed towards the production of corn and mutton, a registered flock being kept and all lambs wintered. Some data for the cost of performing farm operations by an agricultural motor tractor have been obtained from this holding.

Miscellaneous Farms

West of Scotland No. 2. Is a farm almost entirely arable. The principal crop is early potatoes, and after they have been lifted the land is put under catch crops on which sheep are fed. The soil is a sandy loam, and a large amount of manure, both farmyard and artificial, is used. Labour is well-paid and efficient.

West of Scotland No. 3. A mixed arable and dairy farm of medium size, one-quarter of the area being in permanent pasture. The soil varies from a good loam to clay, and the loam is very intensively cropped, large quantities of farmyard and artificial manures being applied. Wheat, oats, hay, and potatoes are part of the output, and there is also a trade in several kinds of green crops. There is a large herd of cows, the milk from which is sold, while sheep are fed off on catch crops.

West of Scotland No. 4. A mixed arable, dairy, poultry, and sheep farm, the arable itself constituting a fairly large holding, while the rough pasture extends over a wide area. Most of the arable is sheep land, and the soil is a variable loam, being of an intractable, stony nature in some parts and bordering on clay in others. The produce sold includes milk, poultry and eggs, potatoes, hay, and sheep, and in most departments the farming would be regarded as active, a good deal being ventured in the application of manures.

South-Eastern No. 4. This is mainly a hop and fruit farm, which has been used for the collection of certain labour costs.

South Midlands No. 3. A small poultry farm, run as a half-time enterprise. The results will be found in the report, illustrating the labour income derived by the tenant from the holding.

South Midlands No. 4. Another small holding run as a part-time enterprise by a railway porter, with the aid of his wife and family. The principal products are pigs and poultry.

South Midlands No. 5. This is a farm on heavy land, managed mainly for dairying and corn. Changes in the management have made it impossible hitherto to collect any reliable information from it other than the earnings of labour.

Northern No. 1. This is also a small holding, the principal output of which is milk and eggs, and the tenant also contracts for horse labour. On small holdings anything in the nature of cost-accounting is difficult unless the bulk of the recording can be done for the farmers. This has not been possible here, but the figures available are of interest as showing the 'labour income' of the tenant, and it is a matter for regret that more results of this kind are not, at present, available so as to throw light upon the economic strength of the small-holder's position both as regards production of food and remuneration of labour.

B. Farm Labour

1. Manual Labour

The figures for the earnings of farm workers given in Tables VI and VII relate to the years 1913–14 and 1914–15. To explain all the differences in the rates of the cash wages and earnings of farm labour a small treatise on the different systems of engaging and paying labour in the various counties would be necessary. For instance, on the farms Midlands No. 1, and East Midlands Nos. 1 and 2, some of the horsemen are boarded, either with the farm foreman or with some other employee, and a considerable part of the wage is paid in the form of allowances of bacon and potatoes to the person providing the board, while in South Midlands No. 2 no such system is met with, and allowances in kind are both small and infrequent. Some men in all classes are given cash bonuses, either at Michaelmas or at some other period of the year, or for the harvest month, while others earn extra by piece-work. These bonuses and piece-work earnings in some cases make considerable additions to the total annual earnings. They are, on the whole, much more important than allowances in kind, for the latter are generally of small value, except in the form of cottages, or the board of single labourers engaged for half-yearly or yearly periods; for married labourers in England they usually amount, where given, to 2*s.* or 2*s.* 6*d.* a week, and this often includes or is equal to the rent of the cottage. In some counties, as in the South-Eastern and South Midlands farms, it will be noticed that allowances in kind are only rarely given to ordinary labourers, and then piece-work becomes of great importance in the earnings of employees of that class.

Ordinary Labourers. For this class the lowest nominal rate of cash wages for men providing their own board in 1913 was 13*s.* in East Midlands Nos. 1 and 2, and the highest reached was £1 4*s.* in West of Scotland No. 3. The figures for the following year, 1914, include those for a farm in one of the very low wage counties, and the lowest rate was reached in South Midlands No. 2 at 12*s.* 6*d.*, the highest being in

South-Eastern No. 3 at £1 0*s.* 3*d.* Including both men who board themselves and those boarded, the lowest rate of nominal weekly earnings for the former year amounted to 12*s.* 6*d.*, which was given in Scotland, an Eastern county coming second with 13*s.* 6*d.* In the latter year the lowest rate, amounting to 12*s.* 7*d.*, was paid in the South Midlands. The highest rate in 1913, amounting to £1 7*s.* 6*d.*, was paid in the West of Scotland; the highest rate for an English county, amounting to £1 4*s.* 5*d.*, was paid in the East Midlands. In the following year the highest rate paid in England was £1 2*s.* 1*d.* on Midlands No. 1; and in the West of Scotland £1 2*s.*

However, total annual earnings may vary from the total of the nominal weekly rate, the amount of the variation depending upon piece-work and extras or bonuses, and upon the loss of time by absence from work. Piece-work is of the greatest importance in the South-Eastern counties and the South Midlands, and extras or bonuses in the East Midlands. Almost invariably some men lose time and money by absence from work. This is partly due to illness, but also to the fact that farm hands are usually supposed to work fifty-two weeks in the year and from six to seven days per week. Consequently if anything in the nature of a holiday is required, or if a man wants to work on an allotment, time may have to be lost. It is noticeable that on one Scottish farm, on which the custom of the Saturday half-holiday is established, much less than the average loss of time in the regular hours of employment occurs amongst ordinary labourers. In most cases actual yearly earnings exceed the total of nominal earnings, but in a few instances loss by absence is sufficient to reduce actual earnings slightly below the nominal rate. Where loss of earnings by absence exceeds 10 per cent., it is usually the case that the employment is recognized as of casual character by both employer and employed, the latter having some other form of employment at other times of the year. This is especially noticeable in regard to the figures from the South-Eastern counties.

TABLE VI. WAGES OF ORDINARY LABOURERS, 1913–1914

	Days in working week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
		Cash.	Kind.	Total.	Cash.			Kind.	Total Earnings.	Cash.	Kind.	Total.		
					Day Work.	Piecework and Special Rates.	Extras.							
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
ENGLAND														
East Midlands No. 1	6	13 0	7 7	1 0 7	33 16 0			19 14 4	53 10 4	13 0	7 7	1 0 7	—	
	6	18 0		18 0	41 3 6		9 2 7½		50 6 1½	19 4½		19 4½	+7·3	5 12 6
	6	18 0		18 0	43 4 9		6 7 10		49 12 7	19 1		19 1	+6	3 11 3
	6–7	18 0		18 0	58 5 1		6 15 8½		48 11 11½	18 8		18 8	+3·8	4 19 9
East Midlands No. 2	6	15 0	9 5	1 4 5	39 0 0			24 8 4	63 8 4	15 0	9 5	1 4 5	—	
	6–7	17 5½		17 5½	43 15 4		1 9 3		45 4 7	17 4½		17 4½	–·3	1 12 2
County Average:		16 7		19 5					51 15 8	17 1		19 11	+2·8	
,, official figures*		15 4		15 11					50 9 8	18 10		19 5		
Eastern Counties No. 1	6	13 6		13 6	34 13 5		5 9 5		41 2 10	15 10		15 10	+16·9	9 7
	6	13 6		13 6	32 14 6		5 16 3		38 10 9	14 10		14 10	+9·5	2 8 6
County Average:		13 6		13 6					39 16 9½	15 4		15 4	+13·3	
,, official figures*		12 7		12 11					39 17 4	15 0		15 4		
South-Eastern No. 1	6	16 7	4 10½	1 1 6	43 4 0		3 12 7	12 13 6	59 10 1	18 0	4 10½	1 2 10½	+6·4	
County Average:		16 7		1 1 6					59 10 1	18 0		1 2 10½	+6·4	
,, official figures*		16 8		17 4					48 15 0	18 1		18 9		
SCOTLAND														
South of Scotland No. 1	6	6 4	7 0	13 4	16 9 4			18 4 0	34 13 4	6 4	7 0	13 4	—	
County Average:		6 4		13 4					34 13 4	6 4		13 4	—	
,, official figures*		15 4							46 7 4			17 10		
South of Scotland No. 2	6	12 6		12 6	32 10 0		1 14 0		34 4 6	13 2		13 2	+5·3	
County Average:		12 6		12 6					34 4 6	13 2		13 2	+5·3	
,, official figures*		17 3							54 16 4			1 1 1		
South of Scotland No. 3	6	1 4 0		1 4 0	60 12 0				60 12 0	1 3 4		1 3 4	–2·8	
	6	18 0	2 0	1 0 0	46 16 0			5 4 0	52 0 0	18 0	2 0	1 0 0	—	1 16 0
County Average:		1 1 0		1 2 0					56 6 0	1 0 8		1 1 8	–1·5	
,, official figures*		14 10							47 0 4			18 1		
West of Scotland No. 2	6	1 3 0	2 0	1 5 0	59 16 0		15 0	5 4 0	65 15 0	1 3 3½	2 0	1 5 3½	+1·1	
	6	1 0 2½		1 0 2½	52 10 6		15 0		53 5 6	1 0 6		1 0 6	+1·4	
County Average:		1 1 7		1 2 7					59 10 3	1 1 11		1 2 11	+1·2	
,, official figures*		15 5							49 8 0			19 0		
West of Scotland No. 3	5½	1 3 0	4 6	1 7 6	58 13 0		2 19 2	11 14 0	73 6 2	1 3 8½	4 6	1 8 2½	+2·5	1 3 0
	5½	1 2 6	4 0	1 6 6	55 13 9		1 7 6	10 8 0	67 9 3	1 1 11½	4 0	1 5 11½	–2	2 16 3
	5½	1 1 0	4 0	1 5 0	54 11 6		10 6	10 8 0	65 10 0	1 1 2	4 0	1 5 2	+·7	6
	5½	1 4 0		1 4 0	62 8 0				61 16 0	1 3 9		1 3 9	–·9	12 0
	5½	1 0 0		1 0 0	52 0 0				52 0 0	1 0 0		1 0 0	—	
County Average:		1 2 1		1 4 7					64 0 3	1 2 1		1 4 7	—	
,, official figures*		17 3							54 16 4			1 1 1		

* 1907.

TABLE VII. WAGES OF ORDINARY LABOURERS, 1914-1915

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
		Cash.	Kind.	Total.	Cash.			Kind.	Total Earnings.	Cash.	Kind.	Total.		
					Day Work.	Piecework and Special Rates.	Extras.							
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
ENGLAND														
South-Eastern No. 1	6	19 3½		19 3½	49 17 0		4 9 8		54 6 8	1 0 11		1 0 11	+8·3	6 0
County Average:		19 3½		19 3½					54 6 8	1 0 11		1 0 11	+8·3	
,, official figures *		16 8		17 4					48 15 0	18 1		18 9		
South-Eastern No. 3	6	18 3		18 3	13 18 2	49 4 3	1 4 6		64 6 11	1 4 9		1 4 9	+35·7	1 10 5
	6	18 3		18 3	16 1 1	47 8 3½	1 3		63 10 7½	1 4 5		1 4 5	+34·1	1 5 4
	6	18 3		18 3	11 2 4	49 6 0	2 6		60 10 10	1 3 3		1 3 3	+27·7	14 8
	7	1 0 3		1 0 3	48 4 0	5 2 0	3 17 6½		57 3 6½	1 2 0		1 2 0	+8·6	
	6	18 3		18 3	8 0 4	48 15 4½	3 0		56 18 8½	1 1 11		1 1 11	+20·1	5 19 11
	6	19 5½		19 5½	50 0 0		4 14 6½		54 14 6½	1 1 0½		1 1 0½	+8·1	12 0
	6	18 5		18 5	33 12 8	18 18 4½	1 1 9		53 12 9½	1 0 7½		1 0 7½	+12	1 11 4
	6	18 3		18 3	11 3 4	40 9 8½	4 1		51 17 1½	19 11½		19 11½	+9·4	4 10 9
	6	18 3		18 3	30 1 5	20 18 3½	16 6		51 16 2½	19 11		19 11	+9·3	1 5 5
	7	19 8		19 8	51 2 0				51 2 0	19 8		19 8	—	
	6	18 3		18 3	1 14 3	26 7 9	9		28 2 9	10 10		10 10	−40·6	26 7 1
	6	18 3		18 3	3 19 7	19 17 2	1 12 11		25 9 8	9 9½		9 9½	−46·2	27 1 7
County Average:		18 8		18 8					51 13 0	19 10		19 10	+6·25	
,, official figures *		16 4		16 9					48 19 4	18 5		18 10		
Midlands No. 1	6	19 7	2 6	1 2 1	48 15 2	1 0 2	11 6	6 10 0	57 16 10	19 9	2 6	1 2 3	+·6	1 4 6
	6	15 0		15 0	30 17 3				30 17 3	11 10½		11 10½	−20·8	8 2 9
County Average:		17 3½		18 6½					44 7 0½	15 9½		17 0½	−8	
,, official figures *		16 7		17 5					48 15 0	17 11		18 9		
East Midlands Nos. 1 snd 2	6	19 0		19 0	47 15 9		8 18 3		56 14 0	1 1 10		1 1 10	+14·9	1 11 3
	6	19 0		19 0	42 1 6	13 1 1	13 9		55 15 4	1 1 5		1 1 5	+12·9	4 4 6
	6	19 1½		19 1½	48 5 6½		5 12 3		53 17 9½	1 0 8½		1 0 8½	+8·3	1 8 9½
	6–7	18 0½		18 0½	46 14 3		5 4 6		51 18 9	1 0 0		1 0 0	+10·7	3 9
	6	13 11½		13 11½	35 18 9		8 2 9		44 1 6	16 11		16 11	+21·4	7 3
	6	13 8½	8 1	1 1 9½	34 11 3			21 1 0	55 12 3	13 4	8 1	1 1 5	−1·8	1 0 9
County Average:		17 1½		18 5½					52 19 11	19 0½		1 0 4½	+10·4	
,, official figures *		15 4		15 11					50 9 8	18 10		19 5		
South Midlands No. 1	6–7	15 5½		15 5½	25 6 6½	19 5 2	17 1 9½		61 13 6	1 3 9		1 3 9	+53·4	17 11
	7	16 4		16 4	41 15 8		4 15 9		46 11 5	17 11		17 11	+9·4	15 0
	6	16 2		16 2	42 2 2		1 16 0½		43 18 2½	16 11		16 11	+4·2	
	6	15 5½		15 5½	26 7 3	12 10 8½	4 16 1		43 14 0½	16 10		16 10	+8·7	4 2 6
	6	15 4½		15 4½	26 14 3	11 15 4	3 19 8½		42 9 3	16 4		16 4	+6·2	3 16 4
	6	13 11½		13 11½	35 15 1		1 3 10		36 18 11	14 3		14 3	+1·8	10 4
South Midlands No. 2	6–7	12 7		12 7	25 11 4	10 10 8½	1 10 3		37 12 3½	14 5½		14 5½	+14·7	6 1
	6–7	12 5½	2 6	14 11½	21 18 6	6 19 3	2 0 9	6 10 0	37 8 6	11 11	2 6	14 5	−3·7	5 2 0
	7	12 7½		12 7½	32 10 8		3 13 0		36 3 8	13 11		13 11	+10·1	6 4
South Midlands No. 5	6	15 7	2 0	17 7	28 9 0	10 0 2	16 6	5 4 0	44 9 8	15 1	2 0	17 1	−2·6	4 15 2
	6	15 7		15 7	26 2 8	16 10 2	14 6		43 7 4	16 8		16 8	+7	2 10 2
County Average:		14 8		15 1					43 2 5	16 2		16 7	+9·4	
,, official figures *		13 0		13 4					38 15 8	14 7		14 11		
SCOTLAND														
West of Scotland No. 1	6	12 0	10 0	1 2 0	9 0 4			26 0 0	35 0 4	3 6	10 0	13 6	−38·7	
County Average:		12 0		1 2 0					35 0 4	3 6		13 6	−38·7	22 3 8
,, official figures *		17 3							54 16 4			1 1 1		

* 1907.

But, taking the average for the counties, actual earnings generally exceed the nominal rate by an amount representing from 2 to 10 per cent. In all cases in which the employment is deemed to be regular, the widest difference between actual and nominal earnings in 1913–15 was between *plus* 16·9 per cent., and *minus* 20·8 per cent.

The rise in wages of farm labourers since 1907 has received a good deal of attention, but from the figures compiled it appears that the ordinary labourers have not shared in the increase to the same extent as other classes. Taking the official figures of 1907[1] as a basis for comparison, the highest increase recorded where a number of men are affected amounts to 3*s.* per week. Up to the middle of 1915 earnings on the South Midlands farms had risen only by 2*s.* 4*d.* over the level of 1907. In the case of both horsemen and cattlemen the increase has been greater. (See Tables VI and VII.)

Horsemen. This class of farm worker is usually employed six days per week, with the additional duty of attending horses on Sundays during the winter, or at such other times as they may be in the stable. But on one Scottish farm the Saturday half-holiday is established as in the case of the ordinary labourers. In 1913–14 the highest and lowest rates of nominal earnings were respectively £1 6*s.* 6*d.* and 15*s.* 6*d.*; the highest and lowest rates of actual earnings being £1 6*s.* 6*d.* and 16*s.* 7*d.* In the later year the highest and lowest rates of nominal earnings were respectively £1 6*s.* 1½*d.* and 12*s.* 1*d.*; the highest and lowest rates of actual earnings amounting to £1 7*s.* 8*d.* and 13*s.* 5*d.* per week. Except when boarded or lodged English horsemen do not usually receive any great proportion of their wages in kind. The usual value ranges between 2*s.* and 2*s.* 6*d.* per week. In the case of Scottish horsemen allowances are of greater importance. Where men find their own board, extras or bonuses in the form of 'Michaelmas money', and piece-work are more important than allowances in kind in the total of earnings. On the whole, horsemen lose less money by absence from work than ordinary labourers. Actual earnings fall below nominal rates in only a very few cases; and taking the average for counties, where a number of men are concerned, the actual earnings for the year exceed the total of the nominal rate by an amount varying from 3·7 per cent. to 14·7 per cent. In 1913–14 the actual earnings did not always exceed the nominal rate, nor, on the other hand, did they fall below the nominal rate in any one case. The greatest difference recorded was an increase of 17·8 per cent. in the case of one man on the Eastern Counties Farm No. 1. In the later year actual earnings fell below the nominal rate in a few instances, in one case to 9·6 per cent.; generally, however, actual earnings exceeded nominal rates, the excess in one case amounting to 19·6 per cent.

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[1] Cd. 5460. 1910.

The increase in the earnings of Scottish horsemen since 1907 is much more noticeable than in the case of English horsemen. Where the earnings of a number of men are recorded, the greatest difference between actual earnings in 1913–14 and the official figures for 1907 amounts to 4*s.* 7*d.* per week on a Lanarkshire farm. This is of more importance because on this farm the nominal week is only 5½ days, with the addition of attendance on Sundays. On English farms employing a number of horsemen, the highest increase recorded is 3*s.* 5½*d.* per week, but in one case the increase from the county average for horsemen in 1907 has amounted to over 7*s.* (See Tables VIII and IX.)

Cattlemen. In the majority of cases cattlemen work seven days a week, or six days with Sunday duties in addition. And except where some part or the whole of the board is provided, as sometimes in the East Midlands, the earnings of the English cattlemen depend mainly upon the nominal rates and extras or bonuses. Allowances in kind are not general amongst the English cattlemen whose earnings are recorded; but they are rather more frequent, and of greater importance, in the earnings of the Scottish cattlemen. Except in two individual cases, piece-work, or work at special rates, is not an important item.

The highest and lowest rates of nominal earnings in 1913–14 were, respectively, £1 10*s.* and 13*s* 4*d.* per week; the

TABLE VIII. WAGES OF HORSEMEN, 1913-1914

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
					Cash.			Kind.	Total Earnings.					
		Cash.	Kind.	Total.	Day Work.	Piecework and Special Rates.	Extras.			Cash.	Kind.	Total.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
ENGLAND														
East Midlands No. 1	6	18 0		18 0	41 14 9		9 16 6½		54 11 3½	1 1 0		1 1 0	+16·5	2 1 3
	6	18 0		18 0	43 10 0		9 3 3½		52 13 3½	1 0 3		1 0 3	+12·5	3 6 0
	6	8 2½	11 10	1 0 0½	21 6 6			30 15 4	52 1 10	8 2½	11 10	1 0 0½	—	
East Midlands No. 2	6	13 5	9 4	1 2 9	34 18 0			24 5 4	59 3 4	13 5	9 4	1 2 9	—	
	6	13 0	7 9	1 0 9	33 16 0			20 3 0	53 19 0	13 0	7 9	1 0 9	—	
County Average:		14 1½		19 11					54 9 9	15 1½		1 0 11	+5·2	
,, official figures*		14 11		18 4					49 8 0	15 7		19 0		
Eastern Counties No. 1	6	16 10		16 10	43 12 6		6 17 10		50 10 4	19 5		19 5	+15·5	1 6
	6	16 6		16 6	42 19 0		5 1 9		48 0 9	18 6		18 6	+11·8	
	6	15 6		15 6	40 7 0		7 4 4		47 11 4	18 3½		18 3½	+17·8	
County Average:		16 3½		16 3½					48 14 1½	18 9		18 9	+14·7	
,, official figures*		14 6		15 6					46 3 0	16 9		17 9		
South-Eastern No. 1	6	17 0	4 10½	1 1 10½	44 4 0		4 9 2	12 13 6	61 6 8	18 8½	4 10½	1 3 7	+7·8	
County Average:		17 0		1 1 10½					61 6 8	18 8		1 3 7	+7·8	
,, official figures*		17 7		18 11					52 4 4	18 9		1 0 1		
SCOTLAND														
South of Scotland No. 1	6	15 9	5 10½	1 1 7	40 17 8			15 5 6	56 3 2	15 9	5 10½	1 1 7	—	
	6	9 11½	7 0	16 11½	25 17 10			18 4 0	44 1 10	9 11½	7 0	16 11½	—	
	6	15 4	1 3	16 7	39 17 3			3 5 0	43 2 3	15 4	1 3	16 7	—	
County Average:		13 8		18 4½					47 15 9	13 8		18 4½	—	
,, official figures*		15 6							49 8 0			19 0		
South of Scotland No. 2	6	1 0 6		1 0 6	53 6 0				53 6 0	1 0 6		1 0 6	—	
County Average:		1 0 6		1 0 6					53 6 0	1 0 6		1 0 6	—	
,, official figures*		17 3							56 11 0			1 1 9		
South of Scotland No. 3	6	1 2 0	2 0	1 4 0	57 4 0			5 4 0	62 8 0	1 2 0	2 0	1 4 0	—	
	6	1 1 0	2 0	1 3 0	54 12 0			5 4 0	59 16 0	1 1 0	2 0	1 3 0	—	
	6	1 0 0	2 0	1 2 0	52 0 0			5 4 0	57 4 0	1 0 0	2 0	1 2 0	—	
County Average:		1 1 0		1 3 0					59 16 0	1 1 0		1 3 0	—	
,, official figures*		14 4							48 15 0			18 9		
West of Scotland No. 2	6	1 1 6	2 0	1 3 6	55 18 0		15 0	5 4 0	61 17 0	1 1 9½	2 0	1 3 9½	+1·2	
	6	1 0 0	2 0	1 2 0	52 0 0		15 0	5 4 0	57 19 0	1 0 3½	2 0	1 2 3½	+1·3	
	6	1 2 0		1 2 0	57 4 0				57 4 0	1 2 0		1 2 0	—	
	6	1 1 0		1 1 0	54 12 0		15 0		55 7 0	1 1 3½		1 1 3½	+1·3	
	6	17 0		17 0	44 4 0		15 0		44 19 0	17 3½		17 3½	+1·7	
County Average:		1 0 3½		1 1 1					55 9 2	1 0 6½		1 1 4	+1·1	
,, official figures*		15 10							53 6 0			1 0 6		
West of Scotland No. 1	5½	1 4 0	2 0	1 6 0	62 8 0			5 4 0	67 12 0	1 4 0	2 0	1 6 0	—	
	5½	1 2 0		1 2 0	57 4 0				57 4 0	1 2 0		1 2 0	—	
West of Scotland No. 3	5½	1 2 6	4 0	1 6 6	58 10 0			10 8 0	68 18 0	1 2 6	4 0	1 6 6	—	
	5½	1 2 0	4 0	1 6 0	57 4 0			10 8 0	67 12 0	1 2 0	4 0	1 6 0	—	
	5½	1 1 6	4 0	1 5 6	55 18 0			10 8 0	66 6 0	1 1 6	4 0	1 5 6	—	
County Average:		1 2 5		1 5 2½					65 10 5	1 2 5		1 5 2½	—	
,, official figures*		17 3							56 11 0			1 1 9		

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* 1907.

TABLE IX. WAGES OF HORSEMEN, 1914-1915

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
					Cash.									
		Cash.	Kind.	Total.	Day Work.	Piecework and Special Rates.	Extras.	Kind.	Total Earnings.	Cash.	Kind.	Total.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s d	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
ENGLAND														
South-Eastern No. 1	6	19 3½	5 2	1 4 5½	50 3 0		8 9 4	13 8 8	72 1 0	1 2 6½	5 2	1 7 8½	+13·2	
County Average :		19 3½		1 4 5½					72 1 0	1 2 6½		1 7 8½	+13·2	
,, official figures *		17 7		18 11					52 4 4	18 9		1 0 1		
South-Eastern No. 3	6	1 0 3		1 0 3	52 12 0		5 6 9		57 18 9	1 2 3½		1 2 3½	+10·1	
	6	1 0 3		1 0 3	52 1 0		3 14 3		55 15 3	1 1 5½		1 1 5½	+6	11 0
	6	15 10		15 10	41 4 0		2 14 0		43 18 0	16 10½		16 10½	+6·5	
County Average :		18 9		18 9					52 10 8	1 0 2		1 0 2	+7·6	
,, official figures *		17 0		18 6					50 18 4	18 1		19 7		
Midlands No. 1	6	19 8½	2 6	1 0 2½	51 5 0		16 6	6 10 0	58 11 6	1 0 0¼	2 6	1 2 6	+1·4	
	6	7 4	10 6	17 10	16 9 4½		7 4	27 6 0	44 2 8½	6 6	10 6	17 0	−4·6	2 10 7½
County Average :		13 6		1 0 0					51 7 1	13 3		19 9	−1·3	
,, official figures *		17 10		19 2					52 8 8	18 10		1 0 2		
East Midlands No. 1	6	19 0		19 0	47 11 5	10 19 4½	10 3		59 1 0½	1 2 8½		1 2 8½	+19·6	1 15 7
	6	19 0		19 0	45 8 7	9 11 9	10 3		55 10 7	1 1 4		1 1 4	+12·5	3 18 5
East Midlands No. 2	6	15 8	9 7	1 5 3	40 16 0			24 16 8	65 12 8	15 8	9 7	1 5 3	—	
	6	14 2	9 10½	1 4 0½	36 16 0			25 13 4	62 9 4	14 2	9 10½	1 4 0½	—	
	6	9 6½	11 6	1 1 0½	19 12 0			29 16 4	49 8 4	7 6	11 6	19 0	−9·6	5 4 10
County Average :		15 5½		1 1 8					58 8 5	16 3		1 2 5½	+3·7	
,, official figures *		14 11		18 4					49 8 0	15 7		19 0		
South Midlands No. 1	6	19 11		19 11	47 11 8	4 18 2	2 13 9½		55 3 7½	1 1 3		1 1 3	+6·7	1 15 4
	6	17 8		17 8	42 4 8	5 17 8	5 10 2½		53 12 6	1 0 8		1 0 8	+16·8	12 2
	6	16 11		16 11	36 1 6	11 13 5	2 13 2½		50 8 2	19 4½		19 4½	+14·4	2 0 6
	6	16 3		16 3	37 7 10½	8 9 6½	2 2 6		47 19 11	18 5½		18 5½	+13·4	1 5 9½
	6	17 2½		17 2½	42 9 2	2 4 3	3 5 3½		47 18 8½	18 5		18 5	+7·1	13 8
	6	15 3½		15 3½	37 9 8½	4 10 6½	1 16 4		43 16 7	16 10		16 10	+10·2	12 2½
	6	14 8		14 8	34 17 6	6 2 3	1 19 0½		42 18 10	16 6		16 6	+12·5	9 6
	6	16 2		16 2	35 19 6	2 9 4	1 12 1		40 0 11	15 5		15 5	−4·7	4 18 6
	6	13 4½		13 4½	31 4 4	4 18 2	1 4 3½		37 6 9½	14 4		14 4	+7·4	1 3 8
	6	12 1		12 1	30 7 6	3 6 8	1 1 11		34 16 1	13 5		13 5	+11	
South Midlands No. 2	6	15 3	2 6	17 9	38 13 4	1 7 8	16 3	6 10 0	47 7 3	15 8½	2 6	18 2½	+2·5	1 14 4
	6	15 3	2 6	17 9	37 19 8		1 0 7	6 10 0	45 10 3	15 0	2 6	17 6	−1·5	
	6	15 3		15 3	36 19 4	2 13 8	2 10 2		42 3 6	16 2½		16 2½	+6·3	
	6	13 4½		13 4½	28 11 7½	7 19 6	19 1		37 10 2½	14 5		14 5	+7·9	
South Midlands No. 5	6	15 7	2 0	17 7	37 17 4	4 17 2	1 2 0	5 4 0	49 0 6	16 10	2 0	18 10	+7·1	
County Average :		15 7½		16 1					45 0 11	16 10½		17 4	+7·7	
,, official figures *		14 1		15 3					43 19 8	15 9		16 11		
SCOTLAND														
West of Scotland No. 1	5½	1 4 0	2 0	1 6 0	62 8 0		16 6	5 4 0	68 8 6	1 4 4	2 0	1 6 4	+1·2	
County Average :		1 4 0		1 6 0					68 8 6	1 4 4		1 6 4	+1·2	
,, official figures *		17 3							56 11 0			1 1 9		
West of Scotland No. 4	6	1 2 7½	3 6	1 6 1½	58 16 0		6 0	9 2 0	68 4 0	1 2 9	3 6	1 6 3	+·4	
	6	1 1 0	3 6	1 4 6	54 12 0		4 0	9 2 0	63 18 0	1 1 1	3 6	1 4 7	+·3	
County Average :		1 1 10		1 5 4					66 1 0	1 1 11		1 5 5	+·3	
,, official figures *		17 6							56 6 8					

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* 1907.

TABLE X. WAGES O

	Days in Working Week.	Average Nominal Weekly Wages.									Tot					
											Cash.					
		Cash.			Kind.			Total.			Day Work.			Piecewo and Special Rates.		
		£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	
ENGLAND																
East Midlands No. 1	7		16	7		9	2	1	5	9	43	3	7			
	7		14	9		7	2	1	1	11	38	7	8½			
	7		11	9½		8	2		19	11½	30	14	1			
County Average :			14	4½				1	2	6½						
,, official figures *			14	10					18	0						
Eastern Counties No. 1	7		16	6					16	6	42	17	7			
	6		13	4					13	4	34	14	9			
	7		15	6					15	6	35	4	9			
	6		13	6					13	6	34	19	7			
County Average :			14	8½					14	8½						
,, official figures *			14	8					15	8						
South-Eastern No. 1	7		18	10		6	0	1	4	10	47	1	6	5	19	1
	6		16	3					16	3	42	0	8			
County Average :			17	6½				1	0	6½						
,, official figures *			18	6					19	11						
SCOTLAND																
South of Scotland No. 1	7		8	0		7	0		15	0	20	16	5½			
County Average :			8	0					15	0						
,, official figures *			13	5												
South of Scotland No. 2	7	1	1	0				1	1	0	54	12	0			
County Average :		1	1	0				1	1	0						
,, official figures *			15	1												
South of Scotland No. 3	7	1	3	0		3	6	1	6	6	59	16	0			
	7	1	1	0		2	0	1	3	0	54	12	0			
	6	1	0	0		2	0	1	2	0	52	0	0			
County Average :		1	1	4				1	3	10						
,, official figures *			13	10												
West of Scotland No. 2	7	1	1	0		2	0	1	3	0	54	12	0			
County Average :		1	1	0				1	3	0						
,, official figures *			12	9												
West of Scotland No. 1	7	1	6	0		4	0	1	10	0	67	12	0			
	7	1	6	0				1	6	0	67	12	0			
West of Scotland No. 3	7	1	3	3		5	0	1	8	3	60	9	6			
	6	1	1	8½		4	0	1	5	8½	56	9	0			
County Average :		1	4	3				1	7	6						
,, official figures *			15	1												

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TABLE XI. WAGES OF CATTLEMEN, 1914-1915

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
					Cash.			Kind.	Total Earnings.					
		Cash.	Kind.	Total.	Day Work.	Piecework and Special Rates.	Extras.			Cash.	Kind.	Total.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
ENGLAND														
South-Eastern No. 1	7	1 0 2	5 4	1 5 6	52 8 2	7 0	17 5 5	13 17 4	83 17 11	1 6 11	5 4	1 12 3	+26·3	
	6	19 3	5 2	1 4 5	49 19 6		9 1 1	13 8 8	72 9 3	1 2 8½	5 2	1 7 10½	+14·4	
County Average :		19 8½		1 4 11½					78 3 7	1 4 10		1 10 1	+20·5	
,, official figures *		18 6		19 11					53 19 0	19 4		1 0 9		
South-Eastern No. 3	7	1 5 9		1 5 9	67 0 0		2 15 6		69 8 0	1 6 8		1 6 8	+3·5	7 6
	7	18 11		18 11	44 15 0	3 5 8	6 1 10		54 2 6	1 0 10		1 0 10	+10	4 9 0
County Average :		1 2 4		1 2 4					61 15 3	1 3 9		1 3 9	+6·4	
,, official figures *		17 11		19 3					52 8 8	18 10		1 0 2		
Midlands No. 1	7	19 8½	2 6	1 2 2½	50 13 0		1 6 9	6 10 0	58 9 9	1 0 0	2 6	1 2 6	+1·2	12 0
	7	18 2	9	18 11	46 15 9			1 19 0	48 14 9	18 0	9	18 9	−·8	8 3
County Average :		18 11		1 0 6½					53 12 3	19 0		1 0 7½	+·4	
,, official figures *		17 7		19 0					51 15 8	18 6		19 11		
East Midlands No. 1	7	16 2	10 0	1 6 2	42 0 10½			26 0 8	68 1 6½	16 2	10 0	1 6 2	—	
	6	13 10½	5 4	19 2½	31 3 1	20 8 4½	2 6	13 17 9	65 11 8½	19 11	5 4	1 5 3	+31·3	1 0 3
	6	14 10½	8 0	1 2 10½	38 12 5½			20 16 8	59 8 1½	14 10½	8 0	1 2 10½	—	
County Average :		15 0		1 2 9					64 7 1½	17 0		1 4 9	+9	
,, official figures *		14 10		18 0					48 15 0	15 7		18 9		
South Midlands No. 1	7	1 3 3		1 3 3	60 7 4		†21 2 7½		81 9 11½	1 11 4		1 11 4	+35	
	6	19 2½		19 2½	38 2 6½	26 3 3	8 17 8½		73 3 6	1 8 2		1 8 2	+46·5	1 4 0
	7	1 5 3		1 5 3	65 11 8		5 1 8		70 13 4	1 7 2		1 7 2	+7·7	
	6	19 2½		19 2½	49 18 8		3 3 4		53 2 0	1 0 5		1 0 5	+6·3	
	6	19 2½		19 2½	45 8 6	3 4 0	1 11 7½		50 4 1½	19 4		19 4	+·5	1 10 0
	7	19 2½		19 2½	49 18 8				49 18 8	19 2½		19 2½	—	
	6	18 2½		18 2½	46 16 11½		2 8 10½		49 5 10	18 11		18 11	+4	9 6½
	6	18 2½		18 2½	43 1 0		5 15 10		48 16 10	18 9½		18 9½	+3·2	4 5 6
South Midlands No. 2	7	1 0 8½	2 6	1 3 2½	53 17 0		3 5 2	6 10 0	63 12 2	1 1 11½	2 6	1 4 5½	+5·3	1 0 6
	7	1 0 4		1 0 4	51 18 0		1 4 2		53 2 2	1 0 5		1 0 5	+·3	1 0 6
	7	1 0 4		1 0 4	51 18 0		1 0 6		52 18 6	1 0 4		1 0 4	—	
County Average :		1 0 3½		1 0 6					58 16 1	1 2 4½		1 2 7	+10·1	
,, official figures *		14 7		15 10					47 0 4	16 10		18 1		
SCOTLAND														
West of Scotland No. 1	7	1 6 0	4 0	1 10 0	74 2 0				74 2 0	1 4 6	4 0	1 8 6	−5	3 18 0
	7	1 2 0		1 2 0	57 4 0				57 4 0	1 2 0		1 2 0	—	
County Average :		1 4 0		1 6 0					65 13 0	1 3 3		1 5 3	−2·8	
,, official figures *		15 1							53 6 0			1 0 6		

* 1907.

† Includes allowance for wife's assistance.

highest and lowest rates of actual earnings were £1 10*s.* and 15*s.* 4½*d.* per week. As in the case of horsemen it is noticeable that at the highest rates nominal and actual earnings are equal.[1] In the later year the highest and lowest rates of nominal earnings were respectively £1 10*s.* and 18*s.* 11*d.*; and the highest and lowest rates of actual earnings £1 12*s.* 3*d.* and 18*s.* 9*d.* In spite of the fact that cattlemen work from six to seven days a week, the loss of earnings by absence from work is surprisingly small. In many cases there is none at all, and the highest loss is not so large as in the case of the ordinary labourers. But in every class the loss of earnings by absence from work is most general in the county where general wages are low. Among cattlemen, actual earnings fall below the nominal rates in only two cases, and there is a greater tendency for actual earnings to equal nominal rates than amongst either ordinary labourers or horsemen. Where the earnings of a number of men are recorded, actual earnings exceed the nominal rate, and this is of greatest importance on South Midlands No. 1 farm. An examination of the separate tables shows that in 1913–14 actual earnings are equal to the nominal rate in the majority of cases, and only in the Eastern and South-Eastern counties is there any important difference. In one case the excess of actual earnings over nominal rates amounts to 20 per cent. In the later year there is a difference in conditions due to a change in the counties represented, this being largely the result of the inclusion of some South Midlands figures. In this year most of the cattlemen earned more than the nominal rate. The highest excess was equal to an addition of 46 per cent. over the nominal rate, in the case of one man in the South Midlands, but this was due to the performance of a very large amount of work at special rates.

Where the earnings of a number of men are recorded, they show an increase over the official figures for the county average for cattlemen in 1907 in every county except the Eastern one. In England, the smallest increase amounts to less than 1*s.* in Midlands No. 1, and the largest increase amounts to over 9*s*., on the South Eastern farm No. 1. This is only a small farm, and where the number of men whose earnings are recorded is greater the increase amounts to about 4*s*. 6*d*. as in the South Midlands. In Scotland there is a more notable difference recorded between average earnings in 1907 and current earnings. (See Tables X and XI.)

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[1] See Table X for 1913–14, West of Scotland, No. 3.

Shepherds. This class of farm workers usually work six days a week in summer, with Sunday duties in addition, and seven days in winter if sheep are folded on arable land. Amongst the earnings recorded, piece-work is absent except in one instance, and actual earnings depend mainly on the nominal rate and on bonuses or extras. As with other classes of labour, there are instances of boarding in the East Midlands; and in several other cases allowances in kind are given, but these do not exceed the value of 2*s*. 6*d*. per week, and may in some instances include a cottage.

The highest and lowest rates of nominal earnings were respectively £1 5*s*. 1½*d*. and 15*s*. 2*d*.; the highest and lowest rates of actual earnings, £1 5*s*. 1½*d*. and 15*s*. 4*d*. per week. Nearly all the men lost some earnings by absence from work, but only in one case did actual earnings fall below the nominal rate, and in the majority actual earnings exceeded the nominal.

With the exception of one instance in the East Midlands, the rates of earnings recorded show little change from the official figures for average rates in the counties in 1907. In two instances the rates are below those quoted for the earlier year, but in each case there was considerable loss of earnings by absence from work. (See Tables XII and XIII.)

Foremen. The number of days per week on which farm foremen work depends on the character of their duties. If they are supervising the work among stock, attendance is generally necessary on seven days; but if they are merely supervising field labour they may not attend more than six days. And, as in the case of ordinary field labourers and horsemen, one of the Scottish foremen works for a nominal week of 5½ days only. Earnings depend on nominal rates,

TABLE XII. WAGES OF SHEPHERDS, 1913-1914

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
		Cash.	Kind.	Total.	Cash.			Kind.	Total Earnings.	Cash.	Kind.	Total.		
					Day Work.	Piecework and Special Rates.	Extras.							
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
ENGLAND														
East Midlands No. 1	7	13 11½	8 7	1 2 6½	36 5 6			22 6 4	58 11 10	13 11½	8 7	1 2 6½	—	
County Average:		13 11½		1 2 6½					58 11 10	13 11½		1 2 6½	—	
,, official figures *		15 4		18 10					52 0 0	16 6		1 0 0		
Eastern Counties No. 1	7	15 6	2 0	17 6	40 7 0		5 16 0	5 4 0	51 7 0	17 9	2 0	19 9	+12·7	
County Average:		15 6		17 6					51 7 0	17 9		19 9	+12·7	
,, official figures *		14 5		15 7					49 16 8	18 0		19 2		
South-Eastern No. 1	7	16 0		16 0	37 3 9		2 12 5		39 16 2	15 4		15 4	−4·3	4 8 3
County Average:		16 0		16 0					39 16 2	15 4		15 4	−4·3	
,, official figures *		17 7		19 0					52 17 4	18 11		1 0 4		
SCOTLAND														
South of Scotland No. 3	7	1 0 0	2 0	1 2 0	52 0 0			5 4 0	57 4 0	1 0 0	2 0	1 2 0	—	
County Average:		1 0 0		1 2 0					57 4 0	1 0 0		1 2 0	—	
,, official figures *		13 11							53 1 8			1 0 5		

* 1907.

TABLE XIII. WAGES OF SHEPHERDS, 1914-1915

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
		Cash.	Kind.	Total.	Cash.			Kind.	Total Earnings.	Cash.	Kind.	Total.		
					Day Work.	Piecework and Special Rates.	Extras.							
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
ENGLAND														
South-Eastern No. 3	7	18 3		18 3	33 17 2	11 6 8	6 2 1½		51 15 11½	19 11		19 11	+9·2	4 2 6
County Average:		18 3		18 3					51 15 11½	19 11		19 11	+9·2	
,, official figures *		17 10		19 3					55 0 8	19 9		1 1 2		
East Midlands No. 1	7	15 2½	9 11	1 5 1½	39 10 0			25 16 4	65 6 4	15 2½	9 11	1 5 1½	—	
County Average:		15 2½		1 5 1½					65 6 4	15 2½		1 5 1½	—	
,, official figures *		15 4		18 10					52 0 0	16 6		1 0 0		
South Midlands No. 1	7	18 0		18 0	46 10 10		4 16 5½		51 7 3½	19 9½		19 9½	+9·8	4 6
South Midlands No. 2	7	12 8½	2 6	15 2½	32 18 6		2 8 0	6 10 0	41 16 6	13 7	2 6	16 1	+5·7	2 6
County Average:		15 4		16 7					46 11 11	16 8		17 11	+8	
,, official figures *		14 5		15 6					45 5 8	16 4		17 5		
SCOTLAND														
West of Scotland No. 4	7	1 1 6	3 6	1 5 0	55 16 9			9 2 0	64 18 9	1 1 6	3 6	1 5 0	—	
County Average:		1 1 6		1 5 0					64 18 9	1 1 6		1 5 0	—	
,, official figures *		15 5							56 2 4	1 1 7				

* 1907.

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TABLE XIV. WAGES OF FOREMEN, 1913–1914

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
					Cash.									
		Cash.	Kind.	Total.	Day Work.	Piecework and Special Rates.	Extras.	Kind.	Total Earnings.	Cash.	Kind.	Total.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
ENGLAND														
East Midlands No. 1	6	15 0	9 9	1 4 9	39 0 0			25 7 0	67 7 0	15 0	9 9	1 4 9	—	
South-Eastern No. 1	6	1 10 0	9 9	1 19 9	78 0 0		2 1 10	25 7 0	105 8 10	1 15 9¾	9 9	2 0 6¾	+2	
Average :				1 7 3					86 7 11			1 12 8		
SCOTLAND														
South of Scotland No. 2	6	1 1 0	—	1 1 0	54 12 0				54 12 0	1 1 0		1 1 0	—	
West of Scotland No. 1	6	1 10 0	4 0	1 14 0	78 0 0			10 8 0	88 8 0	1 10 0	4 0	1 14 0	—	
West of Scotland No. 2	6	1 3 0	2 0	1 5 0	59 16 0		20 0 0	5 4 0	85 0 0	1 12 8¼		1 12 8¼	+30·7	
West of Scotland No. 3	5½	1 2 6	8 6	1 11 0	58 10 0			22 2 0	80 12 0	1 2 6	8 6	1 11 0	—	
Average :				1 7 9					77 3 0			1 9 2		

TABLE XV. WAGES OF FOREMEN, 1914–1915

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
					Cash.									
		Cash.	Kind.	Total.	Day Work.	Piecework and Special Rates.	Extras.	Kind.	Total Earnings.	Cash.	Kind.	Total.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d	£ s. d.	£ s. d.	%	£ s. d.
ENGLAND														
South-Eastern No. 1	6	1 11 11¼	9 4	2 1 3¼	83 0 6		10 16 3	24 5 4	118 2 1	1 16 1¼	9 4	2 5 5¼	+10·9	
South-Eastern No. 4	6	1 3 4¾		1 3 4¾	60 16 0		5 16 10		66 12 10	1 5 7¾		1 5 7¾	+9·6	
East Midlands No. 1	6	16 9	10 1	1 6 10	43 11 0			26 5 3	69 16 3	16 9	10 1	1 6 10	—	
	6	15 3	2 6	17 9	21 18 1	11 13 3	1 3 10	6 10 0	50 12 1	16 11¼	2 6	19 5¼	+9·5	13 0
South Midlands No. 2	6	1 3 6¾	3 0	1 6 6¾	61 5 0	11 0		7 16 0	69 12 0	1 3 9¼	3 0	1 6 9¼	+·78	
Average :				1 7 2					74 19 1			1 8 10		
SCOTLAND														
West of Scotland No. 1	6	1 10 0	4 0	1 14 0	78 0 0			10 8 0	84 2 4	1 8 4¼	4 0	1 12 4¼	−4·8	4 5 8

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allowances in kind, and bonuses or extras. Piece-work is important in one instance only, but allowances in kind are of greater value than those given to any other class of workman, which may be due partly, in some cases, to the occupancy of a good cottage, or house, on the farm. The large bonus given in one instance is interesting, because it is designed to enable the foreman to accumulate capital in order to become a farmer. The average nominal earnings of farm foremen in England, as recorded, amount to about £1 7*s.* per week; and the average actual earnings to about £1 10*s.* In Scotland the figures are somewhat similar. The highest and lowest rates of nominal earnings are £2 1*s.* 3*d.* and 17*s.* 9*d.* respectively; the highest and lowest rates of actual earnings being £2 5*s.* 5*d.* and 19*s.* 6*d.* per week. Wages vary with the nature of duties and the amount of responsibility, but the low scale of remuneration for the highest position attainable on the farm does not hold out much prospect to the worker. (See Tables XIV and XV.)

Women and Boys. The earnings of women regularly employed, as recorded here, are limited to Scottish farms. Nominal and actual earnings on these farms vary between 13*s.* 9*d.* and £1 4*s.* 4*d.* per week. In some cases actual earnings fall below nominal rates, but in no instance is there any excess. Women milkers who do not give their whole time to the work of the farm are paid at nominal rates varying from 3*s.* to 10*s.* 7*d.* per week; the highest and lowest rates of actual earnings are 10*s.* 2*d.* and 3*s.* respectively. None of these women in part-time employment receive allowances in kind, though some receive extras or bonuses. The earnings of boys obviously depend on the age and capacity of the individual, as to which detailed information cannot be given. Apart from this, earnings are determined by the nominal rates and the amount of extras, for both allowances in kind and piece-work are comparatively rare. There is some loss of earnings by absence from work, again notably in the South Midlands, but actual earnings usually exceed the normal rates. The highest and lowest rates of nominal earnings were in England 11*s.* 4*d.* and 2*s.* 6*d.*, and in Scotland

15*s.* 6*d.* and 8*s.* The highest and lowest rates of actual earnings were 13*s.* 4*d.* and 2*s.* 8*d.* in England, and 15*s.* 6*d.* and 7*s.* 4*d.* in Scotland. (See Tables XVI, XVII, XVIII, XIX, XX, and XXI.)

Perhaps the most striking result of the collection of these records of the actual earnings of farm workers is that the increase since 1907 is shown to be but slight. The records extend to the end of the first year of the war, but on some farms they show rates only equal to, or sometimes below, the official figures for the county average of the different classes of labour in 1907. On the other hand the increases shown on some individual farms are comparatively large. It thus appears that the influences which determine the rates of wages for farm labour are to a large extent local in character. But, from the point of view of the farm manager, the main question which arises is whether a larger or a smaller amount of intelligence and energy is purchased for a given sum where wages are comparatively low than where they are comparatively high. At present no definite answer can be supplied, though some evidence will be found later, in considering the cost of farm operations (see p. 67), but a continuation of the records should make a decision possible in the future.

However, it may be that influences now at work will result in a considerable levelling up of the earnings of farm labourers in the various districts. Increase due to prevailing conditions did not occur on the farms for which earnings were recorded until early in 1915, and they were then more important in the areas in which rates are comparatively low. The cash wages of labourers earning 14*s.* a week or upwards, at the end of 1914, were increased by the following amounts during the first half of 1915:—

County.	*Amount of Increase per Week.*
Kent	1*s.* to 2*s.*
Lincolnshire	1*s.* 6*d.*
Oxfordshire	1*s.* Boys 6*d.*
Surrey	1*s.* to 3*s.*

TABLE XVI. WAGES OF WOMEN.—WHOLE TIMERS, 1913-1914

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
					Cash.									
		Cash.	Kind.	Total.	Day Work.	Piecework and Special Rates.	Extras.	Kind.	Total Earnings.	Cash.	Kind.	Total.		
SCOTLAND		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
South of Scotland No. 3	6	1 1 6½	2 9½	1 4 4	56 0 0			7 5 0	63 5 0	1 1 6½	2 9½	1 4 4	—	
West of Scotland No. 1	5½	19 0		19 0	48 9 0				48 9 0	18 8		18 8	−1·9	19 0
	5½	16 0	2 0	18 0	40 16 0			5 4 0	46 0 0	15 8	2 0	17 8	−1·7	16 0
West of Scotland No. 3	6	10 3	7 6	17 9	26 13 6			19 10 0	46 3 6	10 3	7 6	17 9	—	
County Average :		15 1		18 3					46 17 6	14 10		18 0	−1·3	

TABLE XVII. WAGES OF WOMEN.—WHOLE TIMERS, 1914-1915

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
					Cash.									
		Cash.	Kind.	Total.	Day Work.	Piecework and Special Rates.	Extras.	Kind.	Total Earnings.	Cash.	Kind.	Total.		
SCOTLAND		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
West of Scotland No. 1	5½	18 0		18 0	46 16 0				46 16 0	18 0		18 0	—	
	5½	17 0		17 0	44 4 0				44 4 0	17 0		17 0	—	
	5½–6	17 2		17 2	41 3 0				41 3 0	15 10		15 10	−7·6	3 8 0
County Average :		17 4½		17 4½					44 1 0	16 11		16 11	−2·6	
West of Scotland No. 4	7	12 0	1 9	13 9	31 4 0			4 11 0	35 15 0	12 0	1 9	13 9	—	

TABLE XVIII. WAGES OF WOMEN.—MILKERS, 1913–1914

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
					Cash.									
		Cash.	Kind.	Total.	Day Work.	Piecework and Special Rates.	Extras.	Kind.	Total Earnings.	Cash.	Kind.	Total.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
ENGLAND														
Eastern Counties No. 1	6	7 4		7 4	19 2 0				19 2 0	7 4		7 4	—	
SCOTLAND														
South of Scotland No. 3	6	3 0		3 0	7 16 0				7 16 0	3 0		3 0	—	
West of Scotland No. 1	5½	5 3		5 3	13 13 0				13 13 0	5 3		5 3	—	
West of Scotland No. 3	6	4 9		4 9	12 17 0				12 7 0	4 9		4 9	—	
County Average :		5 0		5 0					13 0 0	5 0		5 0	—	

TABLE XIX. WAGES OF WOMEN.—MILKERS, 1914–1915

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
					Cash.									
		Cash.	Kind.	Total.	Day Work.	Piecework and Special Rates.	Extras.	Kind.	Total Earnings.	Cash.	Kind.	Total.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d	£ s. d.	£ s. d.	%	£ s. d.
ENGLAND														
South Midlands No. 1	7	10 6½		10 6½	24 17 4		1 13 4		26 10 8	10 2½		10 2½	−3·2*	2 11 0
	7	10 7		10 7	22 13 4½		1 1 3		23 14 7½	9 1½		9 1½	−13·9*	4 18 3½
South Midlands No. 2	7	5 7½		5 7½	14 12 0				14 12 0	5 7½		5 7½	—	
County Average :		8 11		8 11					21 12 5	8 4		8 4	−6·5	
South-Eastern No. 1	7	8 7½		8 7½	22 8 8		6		22 9 2	8 8		8 8	+·1	
SCOTLAND														
West of Scotland No. 1	6	5 3		5 3	13 2 6				13 2 6	5 1		5 1	−3·8*	10 6
	6	6 7		6 7	10 4 3	2 5 2			12 9 5	4 9½		4 9½	−26·9*	6 17 3

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* These losses are only apparent, being due to the occasional but irregular employment of the women in field labour.

TABLE XX. WAGES OF BOYS, 1913–1914

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
					Cash.									
		Cash.	Kind.	Total.	Day Work.	Piecework and Special Rates.	Extras.	Kind.	Total Earnings.	Cash.	Kind.	Total.		
		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
ENGLAND														
East Midlands No. 1	Boys not usually employed regularly	7 5½	1 5	8 10	18 12 3		1 0	3 12 0	22 5 3	7 2	1 5	8 7	−3·2	15 9
Eastern Counties No. 1		11 4		11 4	29 8 8		4 17 1		34 5 9	13 2		13 2	+16·4	
		6 7		6 7	17 3 0		1 6 5		18 9 5	7 1		7 1	+7·7	
County Average :		8 11½		8 11½					26 7 7	10 2		10 2	+12·3	
South-Eastern No. 1		12 0		12 0	31 4 0		3 10 9½		34 14 9½	13 4		13 4	+11·3	
		10 3		10 3	26 7 6		1 18 0½		28 5 6½	10 10½		10 10½	+6·3	4 6
County Average :		11 1½		11 1½					31 10 2	12 1½		12 1½	+8·8	
SCOTLAND														
South of Scotland No. 3		8 0	2 0	10 0	20 16 0			5 4 0	26 0 0	8 0	2 0	10 0	—	
West of Scotland No. 2		13 9½		13 9½	35 17 0				35 17 0	13 9½		13 9½	—	
		14 0		14 0	35 12 2				35 12 2	13 8½		13 8½	−2·1	15 4
County Average :		13 11		13 11					35 14 7	13 9		13 9	−1·1	
West of Scotland No. 1		8 0		8 0	19 4 0				19 4 0	7 4½		7 4½	−7·6	1 12 0
West of Scotland No. 3		15 6		15 6	40 7 0				40 7 0	15 6		15 6	—	
County Average :		11 9		11 9					29 15 6	11 5½		11 5½	−2·8	

TABLE XXI. WAGES OF BOYS, 1914-1915

	Days in Working Week.	Average Nominal Weekly Wages.			Total Yearly Earnings.					Average Actual Weekly Earnings.			Percentage of Difference between Nominal and Actual Earnings.	Loss by Absence.
					Cash.									
		Cash.	Kind.	Total.	Day Work.	Piecework and Special Rates.	Extras.	Kind.	Total Earnings.	Cash.	Kind.	Total.		
ENGLAND		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	%	£ s. d.
East Midlands No. 1	Boys not usually employed regularly	8 8½	2 8	11 4½	22 1 0			7 0 0	29 1 0	8 6	2 8	11 2	−1·8	11 0
South Midlands No. 1		11 4		11 4	28 10 6		1 19 11		30 10 5	11 9		11 9	+3·4	19 6
		7 7		7 7	18 9 11		1 9 7		19 19 6	7 8		7 8	+1·4	1 3 9
		5 9½		5 9½	14 8 10		18 4½		15 7 2½	5 11		5 11	+2·2	11 7
		4 10½		4 10½	12 7 5		1 11 8		13 19 1	5 4½		5 4½	+10·2	5 11
South Midlands No. 2		7 4		7 4	17 6 4		1 6 6		18 12 10	7 2		7 2	−2·5	1 16 2
South Midlands No. 5		11 0		11 0	25 8 4	4 6 0	11 0		30 5 6	11 8		11 8	+6	
		2 6½		2 6½	5 18 0	1 1 0			6 19 0	2 8		2 8	+5·3	
County Average :		7 2½		7 2½					19 9 7¼	7 5½		7 5½	+3·5	

TABLE XXII. NUMBERS EMPLOYED AND COST PER ACRE, 1913-1914

	Number of Work-People Employed.												Acreage.			Total Wages for Year 1913-1914.			C P A		
	Whole Time.			Part Time.						Total Number.			Arable.	Grass.	Total.						
	Men.	Wom.	Boys.	Men.		Women.		Boys.		Men.	Wom.	Boys.									
	No.	No.	No.	No.	Equivalent Number of Whole-Timers.	No.	Equivalent Number of Whole-Timers.	No.	Equivalent Number of Whole-Timers.	No.	No.	No.	ac.	ac.	ac.	£	s.	d.	£	s	
ENGLAND																					
East Midlands Nos. 1 and 2	20		1	1	·3			4	1·9	20·3		2·9	726	194	920	1241	1	10	1	6	
Eastern Counties No. 1	13	1	4	4	1·3					14·3	1	4	250	150	400	752	18	8	1	17	
South-Eastern No. 1	9		1							9		1	51	179	230	516	0	4	2	4	
SCOTLAND																					
South of Scotland No. 1	8									8			149	315	464	380	9	4		16	4¾
South of Scotland No. 2	5									5			400	300	(moor)	332	17	5		—	
South of Scotland No. 3	12	1	1							12	1	1	—	—	633	809	16	0	1	5	7
West of Scotland No. 1	8	6	1			1	·4			8	6·4	1				814	1	0			
West of Scotland No. 2	10		4							10		4	242	29	271	964	17	4½	3	10	11¾
West of Scotland No. 3	19	8	2							19	8	2	281	69	350	2500	15	6	7	2	7

TABLE XXIII. NUMBERS EMPLOYED AND COST PER ACRE, 1914–1915

	Number of Work-People Employed.												Acreage.			Total Wages for Year 1914–1915.			Cost per Acre.		
	Whole Time.			Part Time.						Total Number.			Arable.	Grass.	Total.						
	Men.	Wom.	Boys.	Men.		Women.		Boys.		Men.	Wom.	Boys.									
	No.	No.	No.	No.	Equivalent Number of Whole-Timers.	No.	Equivalent Number of Whole-Timers.	No.	Equivalent Number of Whole-Timers.	No.	No.	No.	ac.	ac.	ac.	£	s.	d.	£	s.	d.
ENGLAND																					
th-Eastern No. 1	7	1								7	1		51	179	230	551	13	2½	2	8	
th-Eastern No. 3	18		1	5	3					21		1	170	302	473	1421	0	0½	3	0	
lands No. 1	11		1	1	·8					11·8		1	206	244	450	701	8	1½	1	11	
Midlands Nos. 1 and 2	18		3	3	2·2			1	·4	20·2		3·4	726	194	920	1278	3	0½	1	7	
th Midlands No. 1	38	2	7	1	·75					38·75	2	7	478	363	841	2380	6	10½	2	16	
th Midlands No. 2	13	1	1					1	·3	13	1	1·3	266	287	553	644	11	5½	1	3	
th Midlands No. 5	6		1					1	·75	6		1·75	88	50	138	281	13	4	2	0	
SCOTLAND																					
st of Scotland No. 1	8	5	1			2	·6			8	5·6	1				727	13	0			
st of Scotland No. 4	6	1	2			2	·5			6	1·5	2	110	64	174	492	14	8½	2	16	

On Scottish farms no increases were given, and women's wages were not increased.

Some further study of the methods of paying and managing farm labour is necessary for the development of methods of farm management. One or two interesting points arise in connexion with these records, for instance, the comparatively large loss of earnings by absence from work where ordinary labourers are expected to work from six to seven days a week at comparatively low rates; and the comparatively small loss of time where the Saturday half-holiday is given and the rates are higher; also the reduction of the loss by absence as the rates of earnings rise according to the class of labour. The figures available are by no means conclusive, but they indicate profitable lines of study. (See Tables XXII and XXIII.)

2. Horse Labour

a. *Cost of a horse-day*

The cost of horse labour has been ascertained on five farms, and the variations are surprisingly small. The old allowance of half a crown a day has latterly given place in many estimates to three shillings, and these records go to show that there is not much reason to question the accuracy of this figure for general purposes. (See Table XXIV.)

The manual labour represents time spent with the horses that cannot fairly be charged to any particular job. As already explained, the practice adopted is to charge the time of the horsemen to the work on which they are engaged, and not to the horses, and so manual labour on horses represents visits to the forge, wet days spent in cleaning harness, &c. There is no doubt that in the case of the South Midlands farm a much stricter account has been kept of time so spent, which in others has largely gone to other accounts; in the case of the larger Scottish farm, on the other hand, the whole matter has been disregarded and the men's time has been charged entirely to directly productive work.

TABLE XXIV. COST OF FARM-HORSES

Locality.	Number of Horses.	Number per 100 Acres Arable.	Manual Labour.	Foods.		
				Purchased.	Home-grown.	Grazing.
	No.	No.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
East Midlands No. 1	23	3·2	2 1 10	530 3 3	78 6 11	77 13 4
Eastern Counties No. 2	6	3·8	3 14 11	55 5 5	45 0 0	20 8 0
South Midlands No. 2	10	3·7	10 10 5		189 18 0	38 13 4
West of Scotland No. 1	7	4·7	3 12 7	149 7 1		17 17 5
West of Scotland No. 2	14	5·7		371 10 2½		10 0 0

Taking the extreme cases, the difference in the whole cost due to this item amounts to no more than one penny per day.

Coming to foods, which form by far the largest item of cost, it is of interest to note the effect of various systems of feeding on the cost of keep. Thus, in the East Midlands case, where maize and bran were largely bought, the cost is very materially above those where a greater proportion of home-grown corn was consumed. On the Scottish farms there were no previous records of the cost of the home-grown foods, and these were priced, therefore, by the farmers at market prices, as if all had been purchased; the probable effect would be to inflate the total cost to some extent. The cost of grazing is arrived at, as explained later (see p. 91), by getting the total cost of the pastures—rent, rates, labour, manures, &c.—and apportioning it according to the amount of stock carried.

It may not be out of place to refer to a criticism of the accuracy of calculations of horse labour costs based on the assumption that the cost of the foods consumed depends upon the cost of the labour, and vice versa. The question could only be raised by one who had had no experience of cost-accounting on the farm, for experience shows that it happens only rarely that the foods produced with the aid

AND HORSE LABOUR, 1914–1915

Veterinary and Blacksmith.			Depreciation.			Total Cost.			Cost per Horse.			Total Number of Days Worked.	Days Worked per Horse.	Cost of One Day's Horse Labour.
£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.			d.
34	0	8	69	0	0	791	6	0	34	8	1	5,686	247	33·4
28	9	4	18	0	0	170	17	8	28	9	7½	1,182	197	34·7
24	8	3	30	0	0	293	10	0	29	7	0	1,982	198	35·5
4	2	6	21	0	0	195	19	7	27	19	11	1,408	201	33·4
19	6	3	42	0	0	442	16	5½	31	12	7	2,837	203	37·4

of horse labour are consumed by the horses in the year of production. For example, oats produced during the 1914 season will not be consumed, in most cases, until the horses are at work on the 1915 crop, and where this is not so the difficulty is at once removed by the simple expedient of altering the date of the opening of the financial year. The fact that in account-keeping, as in other things, a start must be made somewhere makes it necessary to assume a cost for the produce on the farm at the time of starting; and the first year's figures for the cost of horse labour will be liable to error from this source. In subsequent years the difficulty disappears.

'Veterinary and Blacksmith' does not call for comment, but as regards 'Depreciation' it will be observed that this has been calculated at a fixed sum of £3 per horse. This is regardless of whether there has been any actual depreciation at all, or whether it has really been much higher from bad luck or from any other causes. The principle followed has been described already, and is that the depreciation on a horse, from his maximum value down to death, should be divided equally over his whole working life, for obviously the cost of ploughing an acre of land should be the same whether performed by young horses or old ones—other things being equal. The profit due to the farmer who works young horses appreciating in value must appear in another account, and must not be applied fictitiously to reduce the cost of horse-work on the farm.[1] Whether £3 per annum is the proper figure to represent depreciation calculated in this way depends on the class of horse stock on the farm. It was decided upon before the inflation of values due to the war, and represents a maximum cost of about £60 per horse.

It is of interest to note the amount of time lost by horses on the farm. The greatest possible number of working days in the year is 313, which, of course, could never be reached, but it is obvious that every day spent unnecessarily in the stable adds to the cost of the days worked, and this constitutes a matter well worthy of close attention from the management. The labour-sheet printed on p. 20 is a useful check on the time lost by horses. By casting up the columns provided each day for the number of horses at work, the manager speedily gets to know the proportion borne by the number of days worked to the number of horses on the farm, and forms the habit of investigating discrepancies. In the examples given here it is possible—or even probable—that a certain number of days worked have been omitted from the labour record sheets; figures on the East Midlands farm have been kept for a longer period than on the remainder, and some, at least, of the extra days worked by the horses on it may be attributed to the greater accuracy in recording attained to with the longer experience.

b. *Cost of Cultivations*

A good deal of evidence has been extracted from the farm accounts and labour-sheets as to the cost of cultivations on the various holdings. On examination of the results it became apparent that in most cases the records were not sufficiently complete to admit of drawing useful conclusions. Thus, a record may appear in the labour-sheet showing that so many men and horses have been harrowing a certain field, but there may be nothing to indicate whether the whole field were done, or whether it were done more than once, and the costs as worked out showed very clearly that in many cases there was a shortage of essential information. Once again, the need for further supervision of the work on the farms is indicated.[1] The difficulty does not arise in connexion with ploughing, and some figures for the cost of ploughing two-horse land are given in the Table herewith. It will be noted that on a total of 416 acres less than one acre per day was ploughed. The figures may be compared with those given in Table XXVII for the cost of ploughing by an agricultural motor. (See Table XXV.)

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[1] See C. S. Orwin, *Farm Accounts*, p. 139.

3. Mechanical Power

The consideration of the application of mechanical power to farming processes is a matter of growing importance. Not only does the increasing competition for labour make it necessary for the farmer to substitute labour-saving machinery for hand-power wherever possible, but the accompanying rise in wages will compel him to adopt this means of making labour more productive if costs are to be kept down without a decline in the output from the land. Indeed, it seems likely that the solution of the labour problem will be found in the greater application of machinery to the processes of agricultural production, thus calling forth greater skill from the worker, and qualifying him for wages on a scale more compatible with the requirements of modern social existence. In Mr. T. H. Middleton's book, *The Recent Development of German Agriculture*,[2] it is shown that the production of food per hundred acres in Germany is much greater than in England; on the other hand, if the number of workers engaged in agriculture be brought into

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[1] This lack of material does not affect the determination of the cost of crops; so long as the correct number of men and horses working on a field has been recorded, it is immaterial for this purpose whether they have worked it once or more often.

[2] Cd. 8305.

TABLE XXV. COST OF PLOUGHING, 1914-1915

East Midlands Nos. 1 and 2

Acreage of Field.	Manual Labour.				Horse Labour.				Total Cost.			Cost per Acre.			Remarks.
	Days.	Amount.			Days.	Amount.									
	No.	£	s.	d.	No.	£	s.	d.	£	s.	d.	£	s.	d.	
15	16	2	12	5½	45	6	1	10½	8	14	4		11	7½	
14	11	1	18	7½	31	4	3	11½	6	2	7		8	9	
20	16	2	15	4½	48	6	10	0	9	5	4½		9	3	
23	23	3	11	4	55	7	8	11½	11	0	3½		9	7	
19	26	4	6	1½	52	7	0	10	11	6	11½		11	11	
14	12	2	0	3	33	4	9	4½	6	9	7½		9	3	
23	18	3	3	7	54	7	6	3	10	9	10		9	1½	
13	13	2	1	4	32	4	6	8	6	8	0		9	10	
22	21	3	11	9½	59	7	19	9½	11	11	7		10	6	
23	27	4	15	11½	77	10	8	6½	15	4	6		13	3	
46	49	8	5	6	139	18	16	5½	27	1	11½		11	9½	23 acres twice ploughed
21	25	4	8	10½	72	9	15	0	14	3	10½		13	6	
23	21½	3	15	10	61½	8	6	7	12	2	5		10	6½	
11	21	2	19	0½	42	5	13	9	8	12	9½		15	8½	
29	25	4	3	10	74	10	0	5	14	4	3		9	9½	
15	37	4	4	9½	57	7	14	4½	11	19	2		16	0	Extra for cleaning plough while ploughing [manure in
21	19	3	7	0	56	7	11	8	10	18	8		10	5	
23	24	3	13	11	54	7	6	3	11	0	2		9	7	
14	14	2	9	5	41	5	11	0½	8	0	5½		11	5½	
27	27	4	15	1	81	10	19	4½	15	5	5½		11	8	
416	445½	73	0	1½	1163½	157	11	2	230	2	3½		11	1	

the account, it appears that the production per man is fully 20 per cent. higher in this country.[1]

Now in England less than 16 per cent. of the land consists of holdings under fifty acres, whereas in Germany nearly one-half the total area (48·5 per cent.) is made up of these units of production. It seems fair to assume that the greater opportunity for the employment of horse labour and machinery afforded on the larger holdings of this country contributes to make the English labourer a more efficient workman than his German equivalent, and that any development which will increase still further the opportunities for using machinery will make the labourer's toil still more productive, alike in wages for himself as in food for his country. The farmer, too, would be less dependent on the weather, for with the aid of steam or other mechanical power he could get his field-work done when the conditions were most favourable, working double shifts, if necessary, and even day and night.

In Table XXVI is given the cost of various farm operations performed in the year 1914–15 with the aid of an 18–20 B. H. P. tractor costing £300. Petrol is used to start it, but as soon as the engine is warm it runs on ordinary paraffin. Records have been kept of the number of days worked, the labour employed, and the petrol, paraffin, and lubricant consumed at each class of work. The 'Depreciation' on the machine is calculated on a life of ten years, that is, £30 per annum. There are obvious objections to this basis, for depreciation should depend on the amount of work done rather than on the passage of time, but the work done varies so much in its destructive effect, as, for example, in the case of road haulage on the one hand, and in chaff-cutting on the other hand, that no satisfactory method of distribution along this line suggests itself. Moreover, in an industry so much in its infancy as the manufacture of agricultural motors, the element of time cannot altogether be

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[1] Another calculation places this advantage at 50 per cent. in favour of the English farm labourer. (J. Ellis Barker, 'Germany's Food Legislation', *The Edinburgh Review* October, 1916.)

TABLE XXVI. COST OF WORK BY MOTOR TRACTOR, 1914–1915

South-Eastern No. 3.	Days Worked.	Work done.	Labour.			Petrol.			Paraffin.			Oil and Grease.			Repairs and Sundries.			Licence and Insurance.			Deprecia-tion.			Total Cost.			Cost per
			£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	s. d.
Ploughing	$32\frac{1}{4}$	$76\frac{1}{2}$ acres	12	5	0	1	13	5	13	15	0	1	15	$1\frac{1}{2}$	11	5	1	3	14	10	16	17	4	61	5	$9\frac{1}{2}$	acre 16 0
Road Haulage	$31\frac{1}{2}$	206 miles	11	19	4	1	1	0	4	0	2		12	9	3	5	7	3	13	2	4	18	5	29	10	5	mile 2 $10\frac{1}{4}$
Chaff- and Root-Cutting	10	775 cwt. Roots 224 cwt. Hay 44 cwt. Straw	3	16	0	1	0	3	2	8	6	1	0	$1\frac{1}{2}$	2	0	0	1	3	2	2	19	8	14	7	$8\frac{1}{2}$	ton 5 6
Harvesting	$10\frac{1}{2}$	$54\frac{1}{2}$ acres	3	19	8		3	6	4	5	0		13	4	3	8	6	1	4	4	5	4	7	18	18	11	acre 6 $11\frac{1}{4}$
Total	$84\frac{1}{4}$		32	0	0	3	18	2	24	8	8	4	1	4	19	19	2	9	15	6	30	0	0	124	2	10	

ignored, for it is probable that the patterns of machines now in use will have been superseded entirely during the next ten years. Both 'Repairs' and 'Depreciation' have been distributed in the Table above on the basis of the paraffin consumption, the assumption being made that the greater the amount of fuel consumed the greater would be the wear and tear. 'Licences and Insurance' have been divided in proportion to the number of days worked. The man in charge of the tractor received wages at the rate of 5*s.* 10*d.* per day, including allowances, and he had a boy to help him at 1*s.* per day. As regards the harvesting, it should be noted that the corn was rather badly laid, and most of it could be cut one way only.

Examining the figures it is at once observed that the cost of each operation is considerably augmented by the fact that the machine was in use on hardly more than one day in four. Thus, the fixed charges, insurance, depreciation, &c., tend to overload the cost very materially. Certainly such a machine ought to be able to work on fully three times as many days, and in the following Table, giving the analysis of the unit cost of the various operations as usually performed, figures are also given showing to what the costs would have amounted had the motor been employed to that extent—say about five days per week.[1] (See Table XXVII.) The reduction that might be expected with more regular employment is very considerable, amounting to so much as 3*s.* 7*d.* per acre on ploughing, 6½*d.* per mile on haulage, and 1*s.* 1*d.* per ton on chaff- and root-cutting. Moreover, this does not represent the whole saving possible with more continuous use. It will be noted that the ratio of petrol consumption to paraffin in the case of chaff- and root-cutting is very high, the explanation being that the ten days spent at this work were made up of 160 *half-hours.* Thus, eight times as much petrol was consumed in starting the engine as would have been required if the work had been performed

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[1] For other figures for the cost of ploughing see article on 'Motor Ploughs and Motor Ploughing', by A. Amos, in the *Journal of the Royal Agricultural Society of England* vol. lxxvi. p. 83.

TABLE XXVII. ANALYSIS OF UNIT COST OF WORK BY MOTOR TRACTOR, 1914–1915

(The figures in italics show the estimated costs on the basis of three times as many working days as those on which the motor was actually in use)

	Ploughing.						Road Haulage.						Chaff and Root Cutting.						Harvesting.					
	76½ acres.			229½ acres.			206 miles.			618 miles.			52 tons, 3 cwt.			156 tons, 9 cwt.			54½ acres.			163½ acres.		
	Cost per acre.			Cost per acre.			Cost per mile.			Cost per mile.			Cost per ton.			Cost per ton.			Cost per acre.			Cost per acre.		
	s.	d.	%	*s.*	*d.*	*%*	s.	d.	%	*s.*	*d.*	*%*	s.	d.	%	*s.*	*d.*	*%*	s.	d.	%	*s.*	*d*	*%*
Labour	3	2½	20·0	*3*	*2½*	*25·8*	1	2	40·5	*1*	*2*	*50·3*	1	5	26·4	*1*	*5*	*32·7*	1	5½	21·0	*1*	*5½*	*27·2*
Petrol		5	2·7		*5*	*3·5*		1¼	3·5		*1¼*	*4·4*		4¾	7·0		*4¾*	*8·7*		¾	·9		*¾*	*1·2*
Paraffin	3	7½	22·4	*3*	*7½*	*28·9*		4¾	13·6		*4¾*	*16·8*		11¼	16·9		*11¼*	*20·9*	1	6½	22·5	*1*	*6½*	*29·*
Oil and Grease		5½	2·9		*5½*	*3·7*		¾	2·2		*¾*	*2·7*		4¾	7·0		*4¾*	*8·6*		3	3·5		*3*	*4·5*
Repairs	2	11	18·4	*2*	*11*	*23·7*		3¾	11·1		*3¾*	*13·8*		9¼	13·9		*9¼*	*17·2*	1	3	18·1	*1*	*3*	*23·4*
Licence and Insurance		11½	6·1		*4*	*2·6*		4¼	12·4		*1¼*	*5·0*		5¼	8·0		*1¾*	*3·3*		5¼	6·4		*1¾*	*2·8*
Depreciation	4	5	27·5	*1*	*5½*	*11·8*		5½	16·7		*2*	*7·0*	1	1¾	20·8		*4¼*	*8·6*	1	11	27·6		*7¾*	*11·9*
Total	16	0	100·0	*12*	*5*	*100·0*	2	10¼	100·0	*2*	*3¾*	*100·0*	5	6	100·0	*4*	*5*	*100·0*	6	11	100·0	*5*	*4¼*	*100·0*

in 20 *half-days*. It is obvious that the maximum advantage from the use of mechanical power on the farm can only be obtained in connexion with large-scale production, or by co-operation amongst small farmers.

C. FARMYARD MANURE

The determination of the cost of farmyard manure is one of considerable importance to the farmer. In compounding rations for stock the idea prevails so generally that what is wasted as food is recovered as manure, that there is a danger of piling up the cost of dung beyond its value, by too heavy allowances of concentrated foods. This danger would be reduced if the book-keeping on the farm were such as would direct the attention of the management to the question of relative costs.

The figures given below show the cost of farmyard manure on three farms. The straw costs were ascertained by dividing the total cost of each corn crop between straw and grain, upon the basis of their respective market values. The method has been discussed on p. 38, and is described in detail again later (see p. 86); the costs per ton for each variety of straw on the three farms concerned appear in the tables of crop costs.

If the market values of the straw had been taken, the results would have been very different, but even in those localities where there is a steady market for straw there is nothing to justify a departure from the farmer's own experience by substituting for it the values placed upon the stuff by other consumers. If the principle upon which the division of the total cost between grain and straw be accepted, the figure placed upon the straw represents, in effect, the price paid by the farmer for it, and this is obviously the figure which must be used in all cost calculations into which the price of straw enters.[1]

The cost of the manurial residue of foods is calculated from Voelcker's and Hall's tables. The whole cost of the foods has been charged against the live stock consuming them in the first instance, and they have been credited, subsequently, with the value of the residues; this is then carried to the debit of the farmyard manure account. (See Table XXVIII.)

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[1] See Orwin, *op. cit.*, p. 22.

TABLE XXVIII. COST OF FARMYARD MANURE, 1914–1915

Farm.	Cost of Straw used for Litter.	Manurial Residues of Foods consumed in Yards.	Total Cost.	Number of Loads made.	Cost per Load.	Analysis of Cost.	
						Straw.	Food Residues
	£ s. d.	£ s. d.	£ s. d.	No.	£ s. d.	%	%
East Midlands No. 1	165 16 4	203 11 10	369 8 2	1510	4 10½	·45	·55
South Midlands No. 2	39 5 0	67 8 10½	106 13 10½	500	4 3	·37	·63
Eastern Counties No. 2	54 6 5	14 9 11	68 16 4	380	3 7½	·79	·21

No labour appears in the statement; the cost of littering yards has been charged against the live stock, and labour on emptying yards and on carting and spreading manure has gone against the field or crop benefiting by it. Unfortunately, the total cost can only be given per load, as in no case were any weighings performed. Nor has it been possible to distinguish between the cost of manures from different classes of stock or from varying systems of feeding; these results can only be obtained when more supervision can be given to the recording on the farms, unless, indeed, they belong more properly to the work of an experimental station. The analysis figures show very clearly the extent to which the cost of the manure is affected by the amount of concentrated foods consumed.

D. CROPS

1. Roots

a. *Turnips*

Just as the root-crop, or the bare fallow, must be regarded as the starting-point of the rotation, so it is also the foundation for the determination of the cost of all farm produce. The reason for this is that the cultivations performed at this stage in the rotation are rendered necessary largely to clean the land after the preceding corn crops, and to prepare it for the coming ones. Few farmers would grow turnips for any other reason, and so a portion of the cost of this crop must be carried forward and distributed amongst all those that intervene until the fallow crop comes round again.

It is no new principle. It has long been recognized that the action of certain manures endures for more than one crop, and that proportions of their values must be carried forward to the charge of the crop following that to which they are applied, and the cost of certain of the cleaning processes in the growth of turnips, or the whole cost of the bare fallow, must be treated in the same way. Thus, the determination of the cost of all succeeding crops, and consequently, too, of all live stock, and live stock products, is influenced by the cost of the root crop.

The figures in Table XXIX give the analysed gross cost of growing turnips on four farms in 1914–15. In the case of the East Midlands farm field accounts were kept, so that it is possible to give the details for each field; in the other cases the fields given up to turnips were pooled in one 'Turnip Crop' account.

From this table of the *actual gross* cost of the crops, a second table (Table XXX) showing the *estimated net* cost has been prepared by the elimination of all labour not strictly required for the growth of roots, and further, of all manures which, by the established practice of farm valuations, are held to be unexhausted and available for the following crop or crops. With the aid of the labour-sheets

TABLE XXIX. GROSS COST OF TURNIPS AND SWEDES, 1914-1915

Locality.	Acreage.	Preceding Crops.	Labour.		Manures.			Other Charges.			Total Cost.	Cost per Acre.
			Manual.	Horse.	Purchased.	Farmyard.		Rent and Rates.	Seed.	General Expenses.		
						Loads.	Cost.					
			£ s. d.	£ s. d.	£ s. d.	No.	£ s. d.	£ s. d	£ s. d.	£ s. d.	£ s. d.	£ s. d.
East Midlands No. 1	20	Barley	31 3 8½	27 18 8	12 0 0			13 15 0	6 0 0	9 15 6	100 12 10½	5 0 7½
	12	Wheat	17 8 0½	19 13 4	7 4 0			8 5 0	3 12 0	6 0 11	62 3 3½	5 3 7
	23	Barley	46 10 10	50 9 4	16 0 0			15 3 8	6 18 0	14 14 0	149 15 10	6 10 3
	55		95 2 7	98 1 4	35 4 0			37 3 8	16 10 0	30 10 5	312 12 0	5 13 8
Eastern Counties No. 2	24		30 19 11	27 0 6	45 10 3			36 10 0	7 4 0	18 7 2	165 11 10	6 18 0
South Midlands No. 2	33		61 17 2½	47 12 6	25 8 9	260	65 0 0	38 8 9	9 18 0	35 7 7	283 12 9½	8 12 0
South of Scotland No. 1	23		29 11 0½	26 7 3	50 2 11			18 12 9	6 18 0	3 16 10	135 8 9½	5 17 9

TABLE XXX. NET COST OF TURNIPS, 1914–1915

Locality.	Acreage.	Preceding Crops.	Labour.		Other Charges.			Total Cost.	Cost per Acre.
			Manual.	Horse.	Rent and Rates.	Seed.	General Expenses.		
	No.		£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
East Midlands No. 1	20	Barley	21 11 1½	22 6 8	13 15 0	6 0 0	9 15 6	73 8 3½	3 13 5
	12	Wheat	11 9 11	15 5 4	8 5 0	3 12 0	6 0 11	44 13 2	3 14 5
	23	Barley	23 3 1½	25 9 4	15 3 8	6 18 0	14 14 0	85 8 1½	3 14 3
	55		56 4 2	63 1 4	37 3 8	16 10 0	30 10 5	203 9 7	3 14 0
Eastern Counties No. 2	24		17 14 4	17 3 10½	36 10 0	7 4 0	18 7 2	96 19 4½	4 0 10
South Midlands No. 2	33		35 7 0	30 6 1	38 8 9	9 18 0	35 7 7	149 7 5	4 10 6½
South of Scotland No. 1	23		16 17 8	16 16 0	18 12 9	6 18 0	3 16 10	63 1 3	2 14 10

a list of all operations was made in the case of each farm, and they were then classed as those necessary for the growth of roots, and those done solely to clean the land.

The 'Manual and Horse Labour' represent that which was considered to be fairly chargeable against the root crop, and amounted approximately to two-thirds of the cultivation, &c., performed. The rest of the cost of workings has been carried forward for distribution amongst the succeeding crops.

This apportionment of the cost is not so arbitrary as might seem probable at first sight. With a statement of the work done before him, there is no reason why a sharp and accurate division should not be drawn by the farmer, or his accountant, between those operations performed to clean the land and those necessary to grow the crop.

The charge for 'Rent and Rates' represents an apportionment of these items for the farm as a whole. After deducting the estimated amount of rent and rates chargeable in respect of the farm house, the balance is divided between arable and grass land by the farmer according to his assessment of their respective values, and each part is then split up over the fields on an acreage basis. Buildings are pooled with the land, because land unequipped with buildings is useless, generally speaking, and thus it may be made quite properly to bear whatever proportion of the whole rent might be considered to issue out of the buildings. Rent and rates on the farm house are charged against the farmer's private account, or against the 'General Expenses'.

This method of apportioning rent and rates is the best that can be adopted at present. No one knows so well as the farmer the respective values of the various components of his farm, but as time goes by the accounts themselves will supply the best and only really accurate means of assessing values and of apportioning rent. When a whole rotation of crops has been recorded on any farm, a comparison of the financial results on each field will give a comparison of their values. The figures would be liable to be affected by the seasons, but they would be confirmed or corrected when the results of the second rotation were available.

'General Expenses' are a considerable item, amounting in one case to nearly 25 per cent. of the total cost. The composition and distribution of this charge have already been described (see p. 43), but it may be repeated that in keeping the accounts the practice has been to charge as much as possible of the expenses direct to definite departments. No item has been put into 'General Expenses' which could by any means be included elsewhere, but even so there will always be a number of charges which cannot be dealt with directly, and for which some account such as this one is necessary.[1] In distributing the balance of this account it was decided to bring in only the productive accounts, as thereby work is saved without any sacrifice of accuracy. For example, no share of general expenses is charged to such departments of the farm as 'Purchased Foods', or 'Manures', or 'Horse Labour', for the balances of these accounts are in their turn distributed over the more directly productive departments, such as 'Crops', and 'Live stock'. The method is, therefore, to charge general expenses only against accounts capable of showing a profit, and the principle on which the distribution is made is to vary the amount directly with the turn over of these accounts—an account with a turn over of a thousand pounds bearing twice as much of this charge as one in which the total transactions amount only to five hundred pounds. The assumption made is that the advantage gained by each department from general expenses should bear a close relation to the volume of the transactions in which each is involved, and it is probably very nearly correct. Other methods of distribution have been tried, but none has been found that appeared so satisfactory.

No attempt was made on the farms to record the weight of roots grown, so that the costs in the Table have to be left at per acre instead of at per ton. An analysis of the cost per acre on the several farms gives the following results:—

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[1] See Orwin, *op. cit.*, p. 132.

TABLE XXXI. ANALYSIS OF THE COST OF ONE ACRE OF TURNIPS, 1914–1915

		East Midlands No. 1.				Eastern Counties No. 2.			
		£	s.	d.	%	£	s.	d.	%
Labour	Manual	1	0	5½	27·6		14	9	18·2
	Horse	1	2	11	31·0		14	4	17·7
Rent and Rates			13	6½	18·3	1	10	5	37·6
Seed			6	0	8·1		6	0	7·5
General Expenses			11	1	15·0		15	4	19·0
Total		3	14	0	100·0	4	0	10	100·0

		South Midlands No. 2.				South of Scotland No. 1.			
		£	s.	d.	%	£	s.	d.	%
Labour	Manual	1	1	5½	23·7		14	8	26·7
	Horse		18	4½	20·3		14	7	26·7
Rent and Rates		1	3	3½	25·7		16	3	29·6
Seed			6	0	6·6		6	0	10·9
General Expenses		1	1	5	23·7		3	4	6·1
Total		4	10	6½	100·0	2	14	10	100·0

An analysis on an acreage basis does not possess the interest which would attach to the analysis of the cost per ton of roots. In the former case the percentages are upset for purposes of comparison by variations in the matter of rent, and of rates of pay; in the latter case these points should adjust themselves, for more highly rented land and more highly paid labour should be proportionately more productive, and some interesting and valuable information on these points will be forthcoming when crop-yields are available.

The suggestion was made by a well-known economist, to whom some of the figures appearing in this Report were shown, that rent should be omitted from the calculations altogether, as not entering strictly into the cost of production. This suggestion has been considered very carefully, but, in order to give effect to it, it would have been necessary to make a valuation of each farm with the object of separating interest on capital from true rent, and while this may be undertaken at a future stage of the work it has not been possible so far. The rent paid for the land is included, therefore, as an item of cost in all the determinations, and the balance of probability is that this course is substantially correct. An investigation conducted by the *Land Agents' Society* in the year 1909 showed that about 30 per cent. of the farmer's rent is expended by the landlord on repairs and on management for the maintenance of rent,[1] and on well-equipped farms the balance can represent little or nothing more than the interest on the landlord's capital invested in equipment.

b. *Mangolds*

The cost of the mangold crop is given on two farms only, and in Table XXXII the *gross* cost is stated.

The details of cost have been arrived at exactly in the same way as in the case of the turnip crop, and call for no further explanation. The calculation of the *net* cost differs in two particulars. In the first place, no deduction has been made from the cost of labour in respect of work done to clean the land rather than to grow the crop. That mangolds are a cleaning crop is undeniable, but they are not grown as such in the way that turnips and other kindred crops certainly are. In the second place, only three-quarters of the cost of manures applied to mangolds has been credited to them and carried forward to other crops. In the case of turnips consumed on the land the whole value of manures was credited, but mangolds are invariably carted off, and, following the recommendations of Voelcker and Hall, one-quarter of the manurial value has been taken as being

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[1] *Journal of the Land Agents' Society*, vol. viii, p. 214.

TABLE XXXII. GROSS COST OF MANGOLDS, 1914–1915

Farm.	Acreage.	Preceding Crop.	Labour.		Manures.			Other Charges.				Total Cost.	Cost per Acre.
			Manual.	Horse.	Purchased.	Farmyard.		Seed.	Rent and Rates.	Unexhausted Manures and Cleaning Costs.	General Expenses.		
						Load.	Cost.						
			£ s. d.	£ s. d.	£ s. d.	No.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
East Midlands No. 1	7	Barley	13 18 5½	11 17 4	14 19 3			2 14 3	4 12 5		5 8 8	53 10 4½	7 12 11
	7	Turnips	12 9 0½	8 4 0	15 17 0			2 14 3	4 16 3	9 14 0	6 1 5	59 15 11½	8 10 10
	14		26 7 6	20 1 4	30 16 3			5 8 6	9 8 8	9 14 0	11 10 1	113 6 4	8 1 10½
South Midlands No. 2	14		12 10 2	19 9 6	21 19 8	160	40 0 0	5 8 6	16 6 2		15 4 3	160 18 3	11 9 10½

TABLE XXXIII. NET COST OF MANGOLDS, 1914–1915

Farm.	Acreage.	Preceding Crop.	Labour.		Manures.			Other Charges.				Total Cost.	Cost per Acre.
			Manual.	Horse.	Purchased.	Farmyard.		Seed.	Rent and Rates.	Unexhausted Manures and Cleaning Costs.	General Expenses.		
						Load.	Cost.						
			£ s. d.	£ s. d.	£ s. d.	No.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
East Midlands No. 1	14		26 7 6	20 1 4	7 14 1			5 8 6	9 8 8	3 0 6	11 10 1	83 10 8	5 19 4
South Midlands No. 2	14		42 10 2	19 9 6	5 9 11		10 0 0	5 8 6	16 6 2		15 4 3	114 8 6	8 3 5½

absorbed by the crop, or lost to succeeding crops in some other way. The deduction from the charge for 'Unexhausted Manures and Cleaning Costs' represents the proportion of this item carried forward to be exhausted amongst the remainder of the crops in the rotation. (See explanation, p. 41.)

The net cost for the mangold crop (Table XXXIII) has been analysed on the basis of the cost of one acre. Unfortunately, in this case as also with the turnips, no records of yields are available except in loads, so that neither the net cost per ton, nor an analysis of such cost, can be given. This is much to be regretted, as it would have been of interest to determine to what extent the greater value of the land and the greater application of capital to the crop in the case of the South Midlands farm were balanced by an increased yield.

TABLE XXXIV. NET COST OF MANGOLDS, 1914–1915

Analysis of Cost per Acre

		East Midlands No. 1.				South Midlands No. 3.			
		£	*s.*	*d.*	%	£	*s.*	*d.*	%
Labour	Manual	1	17	8	31·6	3	0	8½	37·1
	Horse	1	8	8	24·0	1	7	10	17·0
Rent and Rates			13	6	11·3	1	3	3½	14·2
Seed			7	9	6·5		7	9	4·8
Manures			11	0	9·2	1	2	1½	13·6
General Expenses			16	5	13·8	1	1	9	13·3
Unexhausted Costs			4	4	3·6				
Total		5	19	4	100·0	8	3	5½	100·0

c. *Potatoes*

Only one account of the cost of this important crop can be given, namely, one for the early potato-growing district of the West of Scotland (Table XXXV). The costs are arrived

at in the way already described except as regards the rent. Another crop follows the potatoes in the same year, and the grower considered that the rent should be apportioned in the ratio of seven to five, the potatoes bearing the larger share. The manure bill is a very heavy item, and undoubtedly some of it should go forward to the next crop, but custom allows nothing where the potatoes are sold off the farm, and it was decided, for this year at all events, to follow the same practice in the accounts.

The crop was sold in the ground, so that the expense of lifting is not included in the labour, nor was it possible to obtain the weight of potatoes lifted, so that no costs per ton can be given. It will be observed that seed and manures account for more than two-thirds of the expenses.

2. Barley

Barley follows naturally after roots, and the cost of this crop on three farms in barley-growing counties is available (Table XXXVI).

In the case of the East Midlands farm field accounts were kept, and the cost per field, as well as the cost for the whole crop, is given. The fact that the barley seems to have been taken 'out of course' on many fields is explained partly, no doubt, by war-cropping, but more by the fact that the turnip crop of the preceding year was largely a failure, owing to drought, and fields which would have been 'barley after roots' became 'wheat after fallow'.

Manual and horse labour on the crops were recorded in each case as already described. With regard to the manures, nothing has been allowed to the crop for the unexhausted values of those applied except in the case of farmyard manures. Two-thirds of the cost of this have been charged against the barley crop, and one-third has been carried forward to the debit of the following crop. This practice has been followed in all cases where farmyard manure is applied to corn crops. The 'Unexhausted Manures and Cleaning Costs' charged have nothing to do with work done or manures applied directly to the barley crops, but represent that proportion of values brought forward from previous crops which is held to be worked off in the barley crop. In the case of manurial residues brought into the account, the whole has also been written off where the barley was to be the last crop in the rotation, otherwise the figure charged represents a proportionate part of this item. (See p. 40.)

The apportionment of 'General Expenses' has been explained already (p. 43), but as regards 'Thatching, threshing, and delivery' it should be added, in the case of the East Midlands farm, that the costs were not actually recorded separately for each field as would appear from the table, but the figures given represent the *total* cost apportioned on an acreage basis. Until, or unless, a practice should be made on farms of stacking, threshing, and delivering corn from separate fields separately, no other method of charging this item of cost can be applied, but it is unlikely that any appreciable error is introduced by the present way of dealing with it.

The 'Total Yield' and the 'Yield per acre' are given both in grain and in straw, the former measured and the latter estimated. It seems very desirable to separate the cost of the grain from that of the straw, but as the two are produced together by the same processes and by the same outlay this cannot be done by any practical means. It may be effected, however, in a theoretical way as already suggested on p. 36, and in the examples given here the distribution of total cost has been made on the basis of a comparison of the supposed market values of the grain and the straw.

The figures in the final column will probably be of greater general interest. These give the cost per quarter of the crop, charging all expenses against the grain only, and ignoring the straw. It will be seen that the cost varies between 24*s.* 6*d.* and 27*s.* 2½*d.* per quarter, the average being 26*s.* 8*d.* per quarter, while the average yield is exactly 4 quarters per acre.

An analysis of the cost per quarter shows the results given in Table XXXVII. As any value of the straw has been ignored in this Table, the percentages represent also the analysis of the cost of the whole crop *per acre.*

TABLE XXXVII. COST OF BARLEY, 1914-1915

Analysis of Cost per Quarter

		East Midlands No. 1.				Eastern Counties No. 2.				South Midlands No. 2.			
		£	s.	d.	%	£	s.	d.	%	£	s.	d.	%
Labour	Manual		4	2	·15·25		5	1	19·45		2	9½	11·5
	Horse		5	3	19·2		3	1	11·8		4	1	16·65
Manures	Purchased		1	0	3·7						3	2½	12·95
	Farmyard		4	0½	14·85								
Rent and Rates			3	5	12·6		6	2	23·45		6	0	24·65
Seed			2	5	8·9		2	4	8·85		3	0½	12·5
Unexhausted Costs				1½	·5		2	6	9·5		1	8½	6·9
General Expenses			2	9½	10·2		3	5½	13·15		1	8	6·6
Thatching, &c.			4	0	14·8		3	8	13·8		2	0	8·25
Total		1	7	2½	100·0	1	6	3½	100·0	1	4	6	100·0

3. Wheat

The cost of wheat growing has been ascertained on three farms, on one of which field accounts were kept (Table XXXVIII). The principles on which the calculations are based, and the methods followed in making them, have been described already when dealing with the barley crop, and call for no further statement in detail. In the two cases where a bare fallow preceded a wheat crop, the manual and horse labour employed have been divided between that which was necessary to prepare for the crop and that which was applied to clean the land. The latter costs have been carried forward for distribution amongst the succeeding crops in the manner already explained (see p. 41).

As with the barley the total cost of the wheat crop has been divided between grain and straw on the basis of their comparative market values, and the greater marketability of wheat-straw renders some such calculation the more necessary. At the same time it is true, probably, that the majority of farmers do not sell their straw, and it is doubtful whether they would accept a valuation on these lines when applied to home consumption rather than to sale. It seems desirable, therefore, to give an alternative calculation for the cost of a quarter of wheat, without deducting the value of the straw, and it is the figure thus arrived at which has been used in the analysis appearing in Table XXXIX. On this basis the cost per quarter varies from 26*s.* to 35*s.* 11*d.*, the average of all the farms being 30*s.* 2*d.* The average yield is a fraction below four quarters per acre. The average price of wheat for the five years 1910–14 was 34*s.* 7*d.* per quarter of 504 lb., so that on the foregoing calculation of cost there

TABLE XXXIX. COST OF WHEAT, 1914–1915

Analysis of Cost per Quarter

		East Midlands No. 1.				Eastern Counties No. 2.				South Midlands No. 2.			
		£	*s.*	*d.*	%	£	*s.*	*d.*	%	£	*s.*	*d.*	%
Labour	Manual		4	0	13·0		7	9½	21·65		4	7	17·7
	Horse		4	0	12·9		4	7½	12·90		5	5½	20·9
Manures	Purchased		1	4½	4·45								
	Farmyard		3	11½	12.8		4	0	11·20				
Rent and Rates			3	7½	11·7		7	6	20·85		5	2½	20·1
Seed			2	8¼	8·7		2	7	7·20		3	5½	13·2
Unexhausted Costs			3	2¼	10·3						4	0	15·4
General Expenses			3	2	10·15		4	10	13·45		1	9½	6·9
Thatching, &c.			4	11	16·0		4	7	12·75		1	6	5·8
Total		1	10	11	100·0	1	15	11	100·0	1	6	0	100·0

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would be a margin of profit amounting to 4*s.* 5*d.* per quarter for the farmer. If the price were to rise to the average figure at which it stood, say, thirty years ago, between the years 1880–4, namely 44*s.*, the margin would be increased by 9*s.* 5*d.* per quarter, which is equivalent to an increase of 37*s.* 8*d.* per acre of wheat grown, assuming an average yield of four quarters per acre.

4. Oats

Three English farms and one Scottish farm figure in the oat costs (Tables XL, XLI). On each of them spring oats only were grown. As with the barley and wheat crops the grain alone was measured, the figures for straw being the farmer's estimates. The average yield of grain on all the farms is just 5½ quarters; the average cost, ignoring the straw, is 16*s.* 11*d.* per quarter, the highest being 20*s.* 5*d.* and the lowest 13*s.* 4*d.* per quarter.

5. Hay

a. *Clover Hay*

The cost of hay is arrived at in the way already described in connexion with other crops, except that an allowance has to be made for the value of the aftermath. In the absence of any figures for the comparative values of the two parts of the crop, the apportionment of the total cost has to be made arbitrarily, and the method followed in the figures given has been to charge all labour on hay-making against the hay, and to apportion the remaining costs as to two-thirds to the hay and as to one-third to the aftermath (Table XLII).

It is doubtful whether 'General Expenses' should be included in the cost. Following the principle laid down that this item is only to be charged against the final products of the farm (see p. 44), it would be included where hay is sold, but omitted where it is produced only to be consumed on the farm. Reliable figures are available from two farms only. The cost per acre in either case is very similar,

TABLE XLII.

COST OF CLOVER HAY, 1914–1915

Farm.	Acreage.	Labour.						Other Charges.						General Expenses.			Total Cost.			Gross Cost per Acre.			Cost of Aftermath.			Cost of Hay.			Total Yield.	Cost per Ton.		
		Manual.			Horse.			Seed.			Rent and Rates.																					
		£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	tons.	£	s.	d.
East Midlands No. 1	20	7	12	1½	6	19	4	17	13	0	13	15	0	5	3	11	51	3	4½	2	11	2	13	16	1	37	7	3½	30	1	4	7
Eastern Counties No. 2	26	5	5	10½	3	8	4½	12	12	0	39	0	0	2	12	9	62	19	0	2	8	5	19	1	7½	43	17	4½	24	1	16	6

but owing to the low yield on the Eastern Counties farm, the costs per ton show a considerable divergence.

b. *Meadow Hay*

No satisfactory analysis of the cost of meadow hay in the year 1914–15 can be given.

6. Pastures and Grazing

In no case did the farm records, as kept, allow of a distinction being drawn between permanent and temporary pastures. The stock, more especially the sheep, are moved about from grass land to seeds, and from one field to another, and, although there is not the slightest reason why an account should not be kept of the number of days spent on each, it has not yet been attempted, and the grazing must be treated as one crop.

As pasturage is nothing more than a food for the live stock of the farm which it is more convenient to produce than to buy, no question of profit or of loss is involved, and it is only necessary to ascertain its cost to the farmer, and to charge this against the stock consuming it. Any profit or loss which may arise from its use will be realized on the sale of the stock.

To determine the cost of the grazing, the expenditure on manual and horse labour is got from the farm labour-sheets and the horse account; purchased manures applied are charged at that proportion of the total cost which represents the amount held to be exhausted during the year, the remainder being carried forward to the years following. The proportion will vary with the nature of the manure; thus, in the East Midlands where chalk is applied to the land it is customary to regard no part of it as being exhausted during the four following years—presumably because it may take that time to become properly incorporated with the soil—after which one-eighth is held to be exhausted annually, and when twelve years have passed from the date of the application the item passes out of the books. Nitrate of soda, on the other hand, would generally be regarded as having no lasting effect, and the whole of its cost would be charged against the year of its application. Farmyard manure is treated in an exactly similar way, two-thirds of the cost in this case being charged against the first season following the application, and the remainder carried forward. The method of apportioning rent and rates has already been described (see p. 42). The values of the manurial residues of the foods consumed on the pastures are got, with the assistance of Voelcker's and Hall's tables, from the Food Record sheets, which indicate the nature and quantity of foods fed to grazing stock. The cost of these residues has always been written off completely after two years, that is, in the year following their application.

In the case of the Eastern Counties farm no records of foods fed on pastures in the year 1913–14 are available, so that no charge for residues can be made.

As no manurial residues have been carried forward, the item for Unexhausted Costs refers only to the cost of seed, sowing, &c., on temporary pastures. On the East Midlands farm the figure seems to be a very low one—some seven shillings per acre—seeing that seed alone will amount, usually, to ten shillings or more. The explanation is that some of these temporary grazings have been down for more than one year, and part of their cost has already been written off. It is not easy to get a reliable basis for this distribution of the cost of forming temporary pastures. In the first place, a farmer does not always know how long he will leave a seed-ley down, for this may depend upon how well it stands, or upon other uncertainties. Where the ley is intended to be left for a definite period, the cost of seed and sowing is written off by equal annual amounts; where the period is uncertain, the cost is distributed as to one-half over the first year, and as to the other half over the second year, or over the second and third years if the ley remains so long. After the third year of an indeterminate period,

Missing Page

nothing is carried forward. It is admitted that this method is to be justified chiefly on the grounds of convenience; a better method may be devised with greater experience, and in the meantime, fortunately, the probable error is a slight one. There is no charge on this head on the Eastern and South Midlands farms, because in both of these cases the only temporary pasture included in the account is that following clover mown for hay, so that the proportion of the cost of seed and sowing chargeable against the grazing appears in the item 'aftermath'. (See later.)

Thus the total cost of the grazing, both permanent and temporary, is arrived at.

On most farms it is not merely sufficient to ascertain the cost of the pastures in order to arrive at the cost of the grazing. Commonly the aftermath from clover and meadow hay fields is grazed, and this grazing must be brought into the account. The most satisfactory way of doing this has not, in all probability, been found as yet. An arbitrary assumption has been made that the cost of the aftermath grass is one-third of the whole cost of the field, excluding hay-making costs. (See p. 89.) Thus, the hay crop has not been charged with this portion of the cost, and it is now brought into the grazing account. Perhaps a better way of dealing with this item would be by comparing its stock-carrying capacity with that of the pasture fields, or by a comparison of the feeding value of the grass and of the aftermath. In the case of the Eastern Counties farm the aftermath accounts for some 25 per cent. of the total cost of grazing, whilst on the East Midlands and South Midlands farms the proportion is only 8 per cent. and 13 per cent. respectively, but nevertheless there is a very close agreement between the unit costs of grazing on each farm, as calculated in the final column of the Table, which suggests that any error due to faulty estimation on this point is not very serious.

Having now arrived at the total cost of grazing, both seeds and grass, pastures and aftermath, it became necessary to devise a means of distributing it among the various classes of live stock. It will happen only rarely that one class of live stock alone is met with on the farm; in certain forms of sheep-farming, or where dairying is practised, it may be possible, sometimes, to charge the whole cost of the grazing to cows or to sheep; but in the great majority of cases the grazing will have been enjoyed by horses, cattle, and sheep indiscriminately. A system has been adopted, therefore, by which all classes of stock are converted into their equivalents as sheep. In the Table under consideration the following conversion scale has been used:

1 horse equivalent to 8 sheep
1 cow or bullock „ „ 6 „
1 yearling beast „ „ 4 „

It is obvious that no scale can have a general application, and the one above is probably too high, except, possibly, for the smaller breeds of sheep. A better way of arranging the figures would be by a comparison of weights, and with further experience there should be no difficulty in arriving at a satisfactory basis. When this has been settled the live stock are reduced to their sheep equivalents, the cost per unit is calculated, and the distribution of the grazing cost is effected. On the three farms under consideration it was found that the cost of grazing varied from 8*s.* 4*d.* to 9*s.* 8*d.* per head of sheep per annum. (Table XLIII.)

E. Milk

a. *Cost of Production*

As already stated, old-established customs controlling purchase and sale have made it impossible, so far, to determine the cost of animal products on the farm. The only exception to this rule is the case of milk, and one reliable statement of the cost of milk production for the year 1914–15, in a herd of about 52 head of dairy Shorthorns, has been obtained.

The calculation of the cost of milk production has received an added importance from the controversy in the public press over the retail price of this article of food, and it is necessary to consider very carefully what, exactly, are the items entering into the cost. An attempt was made in the earlier stages of the work to keep the costs of the various age-classes of dairy stock in water-tight compartments; the plan was to ascertain the cost of the young stock, up to the time of the first calf, by recording the foods and labour spent on them, and to bring them into the dairy herd on calving at a valuation based on this cost. The herd itself was valued at a fixed price per head, representing the estimated cost price, so that the fluctuations of the market were eliminated; the cost of labour, foods, and other expenses were recorded, and cows drafted out of the herd on account of old age, or other cause, were credited to the herd at the valuation figure. In this way the net cost of the dairy herd was to be calculated, and from it the cost of the milk would be found with the aid of the records of milk yields.

This plan had speedily to be abandoned. It was found to be impossible, in practice, to divide the stock into these classes, and then to account accurately for them. Labour could only be apportioned roughly, for it was difficult to divide the men's time satisfactorily where dry cows and young heifers were being tended indiscriminately, and where calf-rearing and milk-production were going on side by side. Similarly, with the feeding, the difficulty of keeping the food costs distinct in cases where there was little or no attempt made to separate the stock for feeding purposes into the classes appearing in the books was really insuperable, and was still further complicated by the practice of fattening-off old cows for the butcher,—a process which will begin while the cow is still in milk, and defies all attempts on the part of the farm accountant to distinguish between the food which produces milk and that which produces meat.

This plan was therefore abandoned, and on reviewing the position it became obvious that all this attempted sub-division of the stock was quite unnecessary. Where milk-production is the object of the management, both the raising of the young stock and the fattening-off of the old cows are essential parts of the whole process. It is not necessary to keep the cost of labour and foods expended on rearing heifers to take their place in the herd separate from the cost of maintaining the herd itself, neither is it necessary to eliminate the cost of feeding-off the old cows. Both of these things contribute to the system of management on farms where the dairy stock is raised by the farmer, and both of them must enter into the cost of the milk produced. The cost of raising the young stock *minus* the profit derived

TABLE XLIV. COST OF THE PRODUCTION OF MILK, 1914-1915

South Midlands No. 2.

	£	s.	d.	£	s.	d.
Valuation of Stock (Cows, Heifers, Calves, and Bulls), 1914	1323	5	0			
Cattle purchased	256	9	1			
				1579	14	1
Costs during the year:						
Manual Labour	201	7	8			
Horse Labour	30	5	9			
				231	13	5
Purchased Foods	468	6	8½			
Home-grown Foods	348	15	7			
	817	2	3½			
Less Value of Manurial Residues	113	15	5			
				703	6	10½
Grazing				219	0	4
Sundry Cash Payments, viz:						
Carriage on Milk	135	14	8			
Veterinary Surgeon	9	16	0			
Medicine	2	1	0			
Milk-recording Society Subscription	3	16	6			
Shorthorn Society Subscription	1	7	0			
				152	15	2
General Expenses (including depreciation on implements and utensils)				114	15	8
				3001	5	6½
Stock sold (Cows, Calves, &c.)	479	5	0			
Valuation of Stock (Cows, &c.), 1915	1364	0	0	1843	5	0
Total Cost of Milk and Carriage				1158	0	6½

Number of gallons produced 30,422
Cost per gallon . . . . 9·135 pence.

from feeding the old cows for beef (or *plus* the loss consequent on this process, as the case may be) represents the cost of maintaining the capital value of the herd—in other words, the depreciation on the cows, a figure very difficult to determine by any direct means.

In Table XLIV, therefore, the cost of keeping the bull, the cost of raising young cow-stock to replenish the herd, the cost of feeding-off old cows for beef, all these items have been slumped with the cost of keeping the milking herd, and together they make up the cost of milk-production on the farm.

This method of calculation can be followed only where milk-production is the main object of the live-stock management, whether for butter, cheese, or new milk. Where the raising of store cattle, or the feeding of beef, is practised other than as an incident of dairying, it is necessary, of course, to take account of these matters separately.

The valuation includes bulls and young stock, as well as cows. It is made on the basis of a fixed figure per head for each class of stock, and this is never varied in conformation with temporary fluctuations of the market. Where breeding stock is being dealt with the importance of keeping the valuation free from the influence of market prices, which are no concern of the man who is not selling, and which are bound to bring about fictitious results, has been stated already.[1] The valuation of the stock will remain constant, therefore, from year to year except in so far as the number of head may vary. The figures used were as follows:—

		£	s.	d.
Cows	at	18	0	0
Heifers 1½ to 2 years . .	„	13	0	0
„ 1 to 1½ „ . .	„	9	0	0
Calves, weaned . . .	„	6	0	0
„ sucking . . .	„	2	0	0
Bulls	„	26	5	0

Manual and horse labour were calculated in the way already described, and the quantities of purchased and home-grown foods consumed are got from the Food record-sheets and priced according to cost in either case—the former at the cost of purchase, and the latter at the cost of production.

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[1] See *ante*, p. 31. Also Orwin, *op. cit.*, p. 10.

It is of the utmost importance to remember that the price of home-grown foods is the cost of growing them and not their value on the market, otherwise serious errors may be introduced into the calculation. In the discussions in the press on the cost of milk it is not infrequently asserted that the increase in the price of hay and straw—amounting to fully 100 per cent.—has thereby increased the cost of producing milk. This does not necessarily follow, indeed, it is safe to say that it has affected the cost very little. The price of hay and straw to the farmer is the cost of producing them, and the fact that the War Office, or some other buyer, is willing nowadays to give twice as much for these things as would have been paid before the war does not necessarily make them more costly to the producer. The farmer who had made a favourable forward contract for the cake supply would charge it against his stock at the price he paid for it, whatever the market value at the moment might be, and, in the same way, he must charge his home-grown products at the price he paid for them and not at some one else's valuation of them.[1]

From the cost of foods is deducted the value of the food-residues chargeable against the Farmyard Manure or the Pastures, according as to whether the foods were fed to stock in yards, or to stock on grass. The addition of the cost of grazing, calculated as already described (see p. 91), completes the food costs.[2] Then follow sundry cash disbursements, the more important of which are the purchase of stock, and payment for the carriage of milk. General Expenses include the share of the establishment expenses chargeable against the cows. The composition of this item and its distribution have been described already. (See p. 43.)

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[1] A similar error may be made in connexion with the cost of horse labour, which is said, sometimes, to cost twice as much as formerly because the value of oats, hay, and straw are twice what they were. For the farmer who grows his own horse-keep, as most farmers do, the cost of horse labour remains pretty much what it was before the war.

[2] Much information on the cost of food in the production of milk will be found in the Reports of the South Eastern Agricultural College, Wye, the University College, Leeds, and the University College, Reading. See Appendix, pp. 123 and 126.

Thus, the *gross* total cost of the milk production is arrived at, and by deducting the sales of draft cows, calves, &c., and also the valuation of the stock at the end of the year, the *net* cost is got. The Milk-record sheets provide the number of gallons of milk produced during the year, and so the cost per gallon is got by division. On the farm in question it amounted to just over 9*d*. per gallon, including the cost of delivery to the retailer, but not including the cost of distribution by him.

A second set of costs is available from another farm, though they are not strictly comparable with the foregoing, belonging as they do to the year from Lady Day, 1915. It may be useful, however, to issue them at the present time, in view of the prevailing conditions. They relate to the farm Midlands No. 2, and the accounts have been kept on a different basis, by desire of the farmer, all home-grown foods being priced at market prices instead of at the cost of production. This method was adopted because the farmer has a market, at his door, for every sort of produce, and he claimed, accordingly, that he was justified in selling his home-grown foods to his cows. This view is not uncommonly held, but it is unsatisfactory in practice for reasons already given. The cost to the farmer of his milk should be the cost to him of the labour and materials used in producing it, not the cost that other people are willing to incur to procure these items. Moreover it is impossible for him to contrast the alternative advantages of milk-selling and direct marketing of produce, if the milk costs are confused by the introduction of outside values in substitution of the farmer's own experience.

In the following calculation these prices have been assigned to home-grown foods:

Mangolds	12*s.* 6*d.*	to	20*s.*	per ton
Oat straw	45*s.*	,,	60*s.*	,, ,,
Hay	70*s.*	,,	100*s.*	,, ,,
Grazing	1*s.*	,,	3*s.*	,, head per week.

TABLE XLV. COST OF THE PRODUCTION OF MILK

April, 1915 to March, 1916

Midland Counties No. 2. (Home-grown foods charged at market prices.)

	£	*s.*	*d.*	£	*s.*	*d.*
Valuation of Stock (Cows, Heifers, Calves, and Bulls), 1915	1357	15	4			
Stock bought	622	18	6			
				1980	13	10
Costs during the year:						
Manual Labour	398	19	2			
Horse Labour	6	5	11			
				405	5	1
Purchased Foods	484	11	9			
Home-grown Foods	841	0	3			
				1325	12	0
Sundry Cash Payments:						
Veterinary Surgeon	1	18	6			
Insurance	11	3	9			
Sundries	3	9	6½			
				16	11	9½
General Expenses				151	3	8½
				3879	6	5
Stock sold	597	12	5			
Valuation of Stock (Cows, &c.), 1916	1615	10	0			
				2213	2	5
Total Cost of Milk				1666	4	0

Number of gallons produced	29,618
Cost per gallon	13·5 pence.

From the evidence supplied by the accounts of this and other farms, it is not too much to say that the price charged for the home-grown produce is 100 per cent. more than the cost of production. Further, no deduction has been made from the cost of the purchased foods for the value of the manurial residues amounting to £115. Deducting this item from the total cost, and also a further sum of £420 in respect of the over-charge for home-grown foods, the total cost of the milk on this farm is £1,131, which is equivalent to 9·165*d.* per gallon. This is almost identical with the cost on the South Midlands farm given in Table XLV, and when the details of cost are also compared, the close correspondence between the figures on the two farms is noteworthy:

	South Midlands, No. 2. Mich., 1914 to Mich., 1915.			Midland Counties, No. 2. Lady Day, 1915 to Lady Day, 1916.		
	£	s.	d.	£	s.	d.
Initial Valuation of Stock	1323	5	0	1357	15	4
Stock bought	256	9	1	622	18	6
Manual and Horse Labour	231	13	5	405	5	1
Costs of Foods, *less* Manurial Residues	922	7	2½	790	12	1
Sundry payments	17	0	6	16	11	9½
Carriage of Milk	135	14	8	None		
General Expenses	114	15	8	151	3	8½
Stock sold	479	5	0	597	12	5
Final Valuation of Stock	1364	0	0	1615	10	0
Total Cost of Milk	1158	0	6½	1131	4	0
Number of gallons produced	30,422			29,618		
Cost per gallon	9·13*d.*			9·17*d.*		

The conditions under which farming is carried on at the Midland Counties farm differ in almost every essential from those prevailing on the South Midland farm. The one is very highly rented, being virtually accommodation land; wages are very high, many of the men making an average through the year between 25*s.* and 30*s.* per week, one even going up to 34*s.* 6*d.*; whilst the market lies, so to speak, at the back door. On the other holding, land equally good lets for about half the money; labour is badly paid, no man getting more than an average through the year of 24*s.* 6*d.* and most of the men making from 14*s.* 6*d.* to 20*s.*, and London, which is the market, is some 70 miles away.

It may be of interest to add that, in the country generally, contracts for milk were made at the following figures: winter, 1914–15, at 10¾*d.*; summer, 1915, at 9¾*d.*; and winter, 1915–16, at 11½*d.* per gallon.[1]

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[1] *The Times*, Nov. 13, 1916.

b. *Cost of the Distribution of Milk*

The costs of distribution are part of the cost of production, but it is convenient to consider them separately. No figures bearing on the cost of retail distribution of milk are available for the year 1914. The subject is one of considerable importance, particularly in view of the present controversy over the retail price of milk, so that it seems desirable to issue some figures which have been prepared for the year 1915–16. They relate to a well-managed business in a large Midland manufacturing town; there are six rounds, and the roundsmen, who are paid by commission on the quantity sold, earn very large wages.

TABLE XLVI. COST OF THE DISTRIBUTION OF MILK, 1915–1916

Locality.	Labour.		Rent.	Depreciation and Sundries.	General Expenses.	Total Cost.	Number of Gallons of Milk distributed.	Cost per Gallon.
	Manual and Clerical.	Horse.						
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.		d.
Midland Manufacturing Town.	1050 13 8½	303 3 0½	75 0 0	81 9 7½	80 5 10	1590 12 2½	95,900	3·98

'Manual Labour' includes the commission on sales representing the roundsmen's wages, and all other expenditure involved in handling the trade, including clerical labour on account-keeping, amounting to £93 12*s.* per annum. 'Horse labour' consists mostly of the keep of the float ponies. The item for 'Depreciation and Sundries' includes the purchase of dairy materials of every kind, and the repair and replacement of utensils. 'General Expenses' are the various establishment expenses other than rent.

The cost of distribution in this case works out to 4*d.* per gallon.

F. THE LABOUR-INCOME FROM SMALL FARMS

On small farms anything of the nature of cost determination has not yet been achieved. They are so frequently managed by the family with little or no paid labour that the cost price of the products could only be arrived at by the inclusion of estimated figures for this important item. It would be of interest and value, however, if the receipts and payments on a number of small holdings could be collected, so as to show, by difference, the return to the family for its labour. The figures would be useful, if collected in sufficient number, for comparison with the earnings of labour on larger farms and for certain other purposes.

1. *Northern Counties No. 1.* This farm is situated in a somewhat remote hill district. The tenant peforms team-labour and sells milk. All the hay and corn are consumed at home by the stock, but there are a few sales of green crops. Two men are employed and the small-holder's two daughters, who work on the farm, receive payment for their services. The cost of their keep is borne by the farmer and must come out of the balance available for his remuneration. (Table XLVII.)

No statement of the capital invested has been received, but the increase in the value of the stock on the place, taken at cost price, has been included in the receipts. The surplus available for the farmer is £70 8*s.* 5*d.*, but as this includes the interest on his capital as well as the remuneration of his labour, it is quite certain that the latter item was considerably less than £1 per week.

2. *South Midlands No. 3.* Several years ago the owner of this holding was a goods porter, earning about 26*s.* per week, in a London railway yard. He bought two acres of land from a land company for £30, upon which he built a bungalow, the materials for the bungalow costing £30, and the owner himself doing the building. At the time the accounts begin the total value of land and bungalow was estimated at £90. The holding is run as a part-time

TABLE XLVII. NORTHERN COUNTIES NO. 1

Summary of Receipts and Payments during the Year March 1, 1914 to February 28, 1915

Receipts.

	£	s.	d.
To Horse Work	151	12	3
,, Milk and Eggs	367	0	5
,, Cows (3)	63	15	0
,, Calves (11)	18	18	6
,, Horses (2)	59	0	0
,, Chickens	1	8	6
,, Rye Straw	3	6	3
,, Vegetables	2	9	5
,, Potatoes	5	10	0
,, Turnips	10	5	3
,, Damaged Hay	1	5	0
,, Increase of Stock (at cost)	17	19	4
	702	9	11

Payments.

	£	s.	d.	£	s.	d.
By Wages:—						
Hired Labour	85	9	10			
Daughter	26	0	0			
Second Daughter	6	10	0			
				117	19	10
,, Purchased Foods				191	11	8
,, Pasturage				3	10	0
,, Milk and Eggs				53	8	7
,, Cows and Heifers (10)				122	10	0
,, Calves (2)				3	1	0
,, Horse				16	10	0
,, Chickens				3	4	10
,, Seeds				7	7	2
,, Artificials				11	2	7
,, Implements				8	3	8
,, Straw				4	16	0
,, Threshing Expenses				2	1	0
,, Blacksmith				2	7	4
,, Veterinary Surgeon				1	12	6
,, Cartwright				2	6	0
,, Rent and Rates				60	12	6
,, Sundries				19	16	10
,, Balance, being Interest on Capital and Labour Income				70	8	5
				702	9	11

enterprise, entirely for the production of eggs and poultry. The estimated rent of the house is not charged to the poultry, and the rent of the land has been advanced from £4 to £4 10*s.* per annum, as the soil was enriched, but while the poultry were charged with this small increase in rent, they have not been credited with manurial values of foods consumed by them. The land is of a gravelly nature, dry but poor. For some time an attempt was made to continue poultry-keeping with gardening, using half the land for poultry and half for vegetables in alternate years. But it was found that the devotion of the whole of the tenant's energies to poultry production gave a greater profit. All the ground is still dug over whenever the pens are shifted. The occupier spends an average of one-half of each working day in attendance on the poultry. At other times he is employed off the holding and so adds to his income. The accounts given are for the three years 1910–11, 1911–12, and 1912–13, and they show a satisfactory rate of progress. (Tables XLVIII, XLIX, and L.)

3. *South Midlands No. 4.* This small holding consists of about one acre of pasture, equipped with poultry-house and pig-styes. It is worked by an employé of a railway who is fully employed at his job, and most of the attention to the holding is given by his wife and children.

In the year 1912–13 there were considerable losses of stock due to disease, and the whole of the stock had to be cleared during the year and replenished by chicks reared, hence the small receipts from chickens However, the aim was to produce eggs. Since 1913 pigs have been added to the holding.

Unfortunately the accounts are not continuous. The results are of interest as giving the value of the work performed by his wife and children to the small-holder (Tables LI and LII.)

TABLE XLVIII. SOUTH MIDLANDS NO. 3, 1910-1911 (POULTRY)

RECEIPTS.	£	s.	d.	£	s.	d.
To 234 Chickens				25	5	3
,, 21,745 Eggs				106	18	0
,, 170 Hons				15	12	2
STOCK.						
Feb. 1, 1911.						
19 Houses	38	0	0			
1 Incubator	3	10	0			
185 Stock Fowls	27	15	0			
				69	5	0
				217	0	5
Total Income				36	10	11
Less Interest on Capital at 5 %				3	8	9
Labour Income				33	2	2

STOCK.	£	s.	d.	£	s.	d.
Feb. 1, 1910.						
18 Houses	36	10	0			
1 Incubator	3	15	0			
190 Stock Fowls	28	10	0			
				68	15	0
PAYMENTS.						
By Foodstuffs				106	4	6
,, Rent				4	0	0
,, Poultry-House				1	10	0
To Balance				36	10	11
				217	0	5

TABLE XLIX. SOUTH MIDLANDS NO. 3, 1911-1912 (POULTRY)

RECEIPTS.

	£	s.	d.	£	s.	d.
To 86 Winter Chickens	10	0	0	10	0	0
,, 183 Chickens				22	3	5
,, 22,095 Eggs				109	16	5
,, 147 Hens				15	7	10
STOCK.						
Feb. 1, 1912.						
19 Houses	37	0	0			
1 Incubator	3	5	0			
189 Stock Fowls	28	17	6			
				69	2	6
				226	10	2
Total Income				39	5	6
Less Interest on Capital at 5 %				3	9	3
Labour Income				35	16	3

STOCK.

	£	s.	d.	£	s.	d.
Feb. 1, 1911.						
19 Houses	38	0	0			
1 Incubator	3	10	0			
185 Stock Fowls	27	15	0			
				69	5	0
PAYMENTS.						
By Foodstuffs				113	9	8
,, Rent				4	10	0
To Balance				39	5	6
				226	10	2

TABLE L. SOUTH MIDLANDS NO. 3, 1912-1913 (POULTRY)

RECEIPTS.	£	s.	d.	£	s.	d.
To 214 Chickens				30	14	10
,, 90 Hens				9	0	9
,, 23,225 Eggs				115	12	6
STOCK.						
Feb. 1, 1913.						
25 Houses and Pens	46	10	0			
1 Incubator	3	10	0			
231 Stock Fowls	33	10	0			
Timber, &c.	4	0	0			
				87	10	0
				242	18	1
Total Income				53	12	4
Less Interest on Capital at 5 %				3	11	7½
Labour Income				50	0	8½

STOCK.	£	s.	d.	£	s.	d.
Feb. 1, 1912.						
21 Houses	40	0	0			
1 Incubator	3	10	0			
189 Stock Fowls	28	2	6			
				71	12	6
PAYMENTS.						
By Foodstuffs				102	3	3
,, Eggs					10	0
,, Rent				4	10	0
,, Timber				10	10	0
To Balance				53	12	4
				242	18	1

TABLE LI. SOUTH MIDLANDS NO. 4, 1912-1913 (POULTRY)

RECEIPTS.	£	s.	d.	STOCK.	£	s.	d.
				March 1, 1912.			
To 20 Hens	1	7	0	58 Fowls	7	5	0
,, 23 Chicks	1	9	0				
,, 2,768 Eggs	11	6	11				
STOCK.				PAYMENTS.			
March 1, 1913.				By Foods	6	1	0
	7	6	3	,, Rent	1	15	0
				To Balance	6	8	2
	21	9	2		21	9	2
Total Income	6	8	2				
Less Interest on Capital at 5 %		7	3				
Labour Income	6	0	11				

TABLE LII. SOUTH MIDLANDS NO. 4, 1915–1916 (PIGS AND POULTRY)

RECEIPTS.	£	s.	d.	£	s.	d.
To 1 Sow and 9 Pigs				11	15	0
,, 1 Sow and 9 Pigs				9	10	0
,, 13 Pigs				13	0	0
,, 2 Fat Pigs				10	18	0
,, 17 Fowls				2	2	6
,, 3,150 Eggs				14	16	11
,, 350 Eggs consumed				1	9	2
STOCK.						
March 1, 1916.						
2 Sows	14	0	0			
2 Pigs	2	0	6			
29 Fowls	3	12	6			
				19	13	0
				83	4	7
Total Income				28	4	7
Less Interest on Capital at 5 %					16	3
Labour Income				27	8	4

STOCK.	£	s.	d.	£	s.	d.
March 1, 1915.						
1 Sow	7	0	0			
5 Young Pigs	6	0	0			
26 Fowls	3	5	0			
				16	5	0
PAYMENTS.						
By Foodstuffs				37	0	0
,, Rent				1	15	0
To Balance				28	4	7
				83	4	7

G. THE NET OUTPUT FROM AGRICULTURE AND ITS DISTRIBUTION

In the *Final Report on the First Census of Production of the United Kingdom (1907)*[1] the net output per head of persons employed in the industries dealt with in the Census of Production Office is given as £104 for England and Wales. The net output is ascertained by deducting the cost of materials at works from the value of the net output at works. This result constitutes for any industry the fund from which wages, salaries, rent, royalties, rates, taxes, depreciation, advertisement, and sales expenses, and all other similar charges have to be defrayed, as well as profits.[2] The same basis of calculation was adopted in the *Report of the Board of Agriculture and Fisheries* on the *Agricultural Output of Great Britain*[3] made in connexion with the Census of Production Act, 1906, when the output per person permanently employed in agriculture was ascertained to be £90, or £129 if the occupiers themselves were excluded.[4] The accounts of half a dozen farms, kept at the Institute for Research in Agricultural Economics, at Oxford, in the year 1914–15, may be cited in general confirmation of this figure, if the rise in prices for agricultural produce since 1906 be allowed for, whilst at the same time they show the distribution of the net output as between landlord, occupier, and labourer. The average net output per man, namely £169, compares with the higher figure given in the Board's Report, as the occupiers have been excluded from the calculation. The farms concerned are mostly fairly large, and it is probable that the output is higher than the average of the country. The figures vary a good deal from farm to farm, but it is noteworthy that the distribution of the net output as between farmer, labour, and landlord is fairly constant, notwithstanding the fact that the farms are scattered all over England and Scotland, and that many varieties of management are represented. One of them is an intensive potato-growing farm; another is a suburban milk-farm; another is situated seven miles from the nearest railway station; but in spite of all these and other differences the net results are more or less the same. The fact noted in the Board of Trade Report that a large net output per head is usually associated with high wages is exemplified by farms A and B. On the other hand, the farm D, which is situated in a county where the rates of wages are almost the lowest in England, bears out this statement equally in the low output per man employed. The farm E may possibly indicate, too, by its results that the experience of industry in that a high net output per head is also associated with heavy capital expenditure will probably be repeated in agriculture, for although the output is relatively low, it will be noted that nearly 50 per cent. of the labour employed was woman labour. (Table LIII.)

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[1] Cd. 6320.

[2] p. 8.

[3] Cd. 6277.

[4] p. 26.

As regards the distribution of the net output, it must be remembered that only in the case of labour is the whole of the share available as net income. Considerable payments have to be met both by the farmer and the landlord out of the shares which they retain, and a recalculation of the figures has been made to show the distribution of what may be termed the *net returns*, as distinct from the *net output.* To do this, all the ordinary expenses except labour and rent have been deducted from the total receipts. Besides these, a figure amounting to 7½ per cent. on the capital invested by the farmer has also been deducted, as representing the interest which capital involved in an enterprise, more or less speculative, might reasonably be expected to earn. Lastly, a deduction has been made to the extent of one-third of the rent, as representing the expenditure upon the holding necessary on the part of the landlord in order to maintain the rent. This is not an arbitrary figure. From an inquiry conducted by the Land Agents' Society in the year 1909, it appeared that about 30 per cent. of the rent received by the landlord is expended by him in repairs, insurance, management, and similar payments necessary to maintain the

TABLE LIII

THE DISTRIBUTION OF THE NET OUTPUT FROM AGRICULTURE

Farm.	Acreage.	Capital per Acre.	Men per 100 Acres.	Net Output.		Distribution of Net Output.				Distribution of Net Output.		
				Total.	Per Man Employed.	Farmer.	Labour.		Landlord.	Farmer.	Labour.	Land-lord.
							Total.	Per Man.				
		£		£	£	£			£	%	%	%
A	1100	8	2·3	4266	169	2111	1377	55	785	49·4	32·2	18·4
B	350	11·5	4·7 *	2900	175	1292	995	58	613	44·6	34·3	21·1
C	189	10	4	1209	158	565	396	52	248	46·7	32·8	20·5
D	550	10	3·6	2569	129	1273	698	35	598	49·6	27·2	23·2
E	270	23·5	8·5 †	3612	157	1625	1078	47	909	45·0	29·8	25·2
F	440	9	2	1671	190	870	382	43	419	52·1	22·9	25·0
Average	483	10·8	3·5	2704	162	1286	821	48	595	47·9	29·9	22·2

* Including casual women labour amounting to about 1 per 100 acres the year through.
† Including casual boy and women labour amounting to about 3½ per 100 acres the year through.

property in a condition to produce the rent.[1] The final difference represents the surplus available for the remuneration of manual labour, for the farmer's reward as manager, and for the landlord's return on his investment. It would have been far more satisfactory if a further deduction could have been made representing interest on the landlord's capital invested in the holding in the form of equipment. If this could have been done the final figure would have represented only the true rent accruing to the landlord in addition to the reward of farmer and labourer, but the information necessary is not available, nor is there any material upon which to form an estimate likely to be even approximately correct.

TABLE LIV

THE DISTRIBUTION OF THE NET RETURNS FROM AGRICULTURE

Farm.	Net Returns.		Distribution of Net Returns.				Distribution of Net Returns.		
	Total.	Per Man Employed.	Farmer.	Labour.		Landlord.	Farmer.	Labour.	Landlord.
				Total.	Per Man.				
	£	£	£	£	£	£	%	%	%
A	3232	128	1332	1377	55	523	41·2	42·6	16·1
B	2307	140	903	995	58	409	39·2	43·1	17·7
C	949	125	388	396	52	165	40·9	41·7	17·4
D	1873	95	776	698	35	399	41·4	37·3	21·3
E	2704	118	1020	1078	47	606	37·7	39·9	22·4
F	1175	134	515	382	43	280	43·6	32·5	23·9
Average	2040	123	822	821	48	397	40·7	39·5	19·8

The average share of each interest on all the holdings is about 20 % to the landlord, 40 % to the farmer, and 40 % to labour. The variations from this average are extraordinarily slight when the differences of locality, soil, size, equipment, capitalization, wages, objects of management, &c., are remembered. The returns are not sufficiently comprehensive to admit of any generalization being made from them, and many more records, extending over longer periods will be required before the various interesting speculations which suggest themselves can safely be followed up.

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[1] The figure is the average expenditure on 224 estates, extending to some 2,000,000 acres. See *Journal of the Land Agents' Society*, vol. viii, p. 214, 1909.

CHAPTER V

CONCLUSION

LET it be stated over again that the figures in the foregoing chapter are introduced not as evidence on which to base generalizations on food and other costs, but to illustrate the method of cost determination, and to show what information may be expected from investigations of farm economics by experimental methods, when sufficient data are available. Not only should a familiarity with farming costs be essential to individual farmers in the direction and development of their own management, but the ability to compare the experience of many individuals is of fundamental importance in the framing of national policy. At the present time far-reaching reforms are under discussion, and the introduction of new factors in production is being urged, none of which can be stated or considered scientifically without access to reliable statistical matter upon which to base the proposed changes. Take, for example, the recommendation of Lord Milner's Committee in regard to a guarantee to farmers as to the price of wheat.[1] Although the Government decided that no action on these lines was necessary at the time, the question is still being very seriously debated, and there is a considerable body of opinion in favour of guaranteed prices for all staple food products, not merely to increase food supplies during the period of the war, but as a kind of War Insurance during times of peace, so that by giving an artificial stability to prices the development of home agriculture might artificially be stimulated, want of confidence in the market acting, it is said, as a deterrent to production under the conditions prevailing before the war. If it should be decided that considerations of public safety require that guarantees of this kind should be given to the farmer, the first essential is to know the normal cost of production of the articles concerned. It should not be regarded as sufficient to collect opinions, or to make estimates. The present controversy over the price of milk shows how many errors can creep into mere estimates of cost, and suggests that in all probability there would be no general agreement between producer or consumer as to what the figure should be. Even should unanimity be achieved the figures would have no reliable basis, and farmers, on the one hand, might be disappointed in the results, or the public, on the other hand, might unconsciously be exploited. The only sound foundation for any scheme of guaranteed prices is a knowledge of the cost of production of the articles concerned.

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[1] Cd. 8048.

Or assume that nothing is done in this direction, and that the decision of the Government, arrived at in 1915, not to interfere by legislation in food prices be confirmed in the future.[1] The importance of a knowledge of the cost of production of food in this country is no whit diminished, for the successful development of the agricultural industry, otherwise than by the increase of technical skill, scientific knowledge, and so forth, will then be dependent on the ability to compare home costs with those of our over-seas Dominions and those foreign countries which largely control our markets. The conclusions drawn from such comparisons should be of a nature to direct attention to the probable course of agricultural prices, and farmers would be forewarned of impending changes and thus forearmed in meeting them.

Take, again, the question of the size of holdings. At the present time there is a strong movement on foot to promote the splitting-up of large farms into small holdings, both by stimulating private action, and by legislation. On the other hand, the idea is growing that agriculture can best be developed by combining large holdings into farms bigger still, for the purpose of applying to agriculture the organization for large-scale production which has been found to be essential in the development of all other industries. Both movements have for their object the provision of a better life for the worker, and more food for the nation, and the comparative advantages of the two courses would be made clearer if the statistical information on the subject were more complete, and if records of the results, social, financial, and productive, of large and small scale production, were available.

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[1] Since this was written the Government has adopted a system of *maximum* prices for certain products, and the reception given to it by the farmers is one more illustration of the urgent need for reliable information.

Take, again, the financing of agriculture. It is common knowledge amongst those interested in the land that farmers, particularly small farmers, do not easily attract capital to their enterprise by the ordinary methods common in industry. The fact that they keep no accounts renders it impossible for them to make the ordinary commercial appeal to financial institutions, and the credit they obtain is got frequently by devious and expensive methods. But bankers are in business to supply credit, not to refuse it, and with the spread of the practice of accountancy as an essential part of the management of the farm, large or small, will come the access to capital which many farmers obtain only with difficulty, or upon exorbitant terms. It seems probable that a development in this direction would go far to render unnecessary the schemes for the provision of credit by State banking organizations, which have proved difficult to devise, and which, even if established, would always be open to the objection that they are based on a recognition of a weakness in farm management which they would do little to remove.

Take, next, the cost of the distribution of food. What does this amount to? It is a matter of frequent observation that, however depressed the condition of British agriculture may be, the middlemen serving the industry contrive to do well out of it, and it is not infrequently asserted that the toll they take for their services is extortionate. This view has been put forward very strongly by the Departmental Committee appointed to consider the settlement and employment of soldiers and sailors on the land, for in their Report[1] they go so far as to state that the difference between the wholesale and retail prices of agricultural products is so great as to represent a degree of economic weakness which would ruin any other industry. The Committee would not have made such an assertion without evidence which satisfied them, but, once again, exact information based on actual records is probably non-existent, and until figures can be produced in confirmation of this statement the difficulty of putting the case for the producer convincingly is obvious.

Consider, now, the distribution of the divisible surplus from farming as between landlord, farmer, and farm labourer. What should be their respective shares in the net returns of agricultural enterprise? Nothing definite is known as to the interest on capital invested in agriculture, nor of the farmer's salary regarded as managing director, and when such questions as the remuneration of farm labourers, with special reference to the establishment of Wages Boards, are being considered so seriously as at the present time, it is of the first importance that accurate information as to the returns from farming should be available. A great society, whose members are well qualified to form conclusions on this point, has expressed the opinion that in normal times it is unlikely that farmers will be able to pay a rate of wages to their labourers high enough to allow the latter to offer a commercial rent for a cottage.[2] Such a statement would not have been made without a full sense of responsibility, but, if it could be supported by reference to records of the cost of production in agriculture, it would gain immensely in weight, and rural social reformers who look to secure economic independence for the farm worker through the regulation of wages by the State would have to take a wider view of the difficulties of the problem. As regards rent, the policy of most landlords in refraining from an adjustment of rental to meet rising prices is not infrequently called in question as contributing to make possible a low standard of production. It is stated, with some show of reason, that the benevolence of landlords in this direction enables their tenants to make a good living without troubling to make their management very energetic, and that the consequent loss to the community is considerable. On the other hand, the difficulty of raising rents to sitting tenants is well known by those concerned with the management of land. The step is bound to be attended with unpopularity, whilst the landlord willing to face this is not infrequently called upon to meet a charge of 'raising the rent on the tenant's improvements'. Here, again, the misunderstanding of the true position, on the one side or the other as the case may be, ought not to arise if both parties were in the habit of basing their relations on financial results rather than on the less substantial grounds of sentiment or assertion.

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[1] Cd. 8182. par. 22.

[2] *Facts about Land.* Prepared by the Land Agents' Society, p. 57.

In fact, it does not seem too much to say that the wide divergencies of opinion on the foregoing, as well as on many other points in the organization of the agricultural industry, and the difficulties in framing sound policies both for the reconstruction of our greatest national industry as a whole, and for the management of individual holdings, are due almost entirely to the lack of statistical information concerning it, particularly such as can only be obtained by scientific book-keeping. It is not pretended that the figures contained in the Report here presented will contribute much to the elucidation of the problems enumerated, but it is hoped that they will be regarded as indicating the beginnings of a movement in that direction. To get results of the maximum value it will be necessary to bring additional strength to bear on the work, and with a fuller realization of its importance this should be forthcoming. There are several hopeful indications; farmers co-operating with the Institute at Oxford have expressed their sense of the value of the work, and other investigators have recognized the need for research along these lines by setting themselves to examine the cost of particular products. These are indications of a growing recognition of the importance to the agricultural industry of the determination of farming costs.

APPENDIX

BIBLIOGRAPHY

(NOTE.—In the case of most of the foreign publications reference has been made to the abstracts issued by the International Institute of Agriculture, at Rome, and not to the originals.)

1. Agricultural Book-keeping in Austria. *Österreichische Agrar-Zeitung*, year IV, no. 6, p. 65.

(An account of the agricultural book-keeping offices in Austria, of which there appear to have been about a dozen in operation at the time of the article, and which were responsible for the accounts of over 1200 farms. The constitution and duties of the bureaux are described, and a statement is given of the cost of running them.)

2. ANDREWS, FRANK. Cost of hauling crops from farms to shipping points. *U.S. Dept. of Agriculture, Bureau of Statistics, Bulletin* 49, pp. 63. Washington, 1907.

(The result of an inquiry conducted by sending out schedules to correspondents of the Bureau of Statistics. The methods of inquiry are described and the value of data discussed. The cost of hauling from farm to local railway station for twenty-three products in all parts of the United States is shown. There is also some discussion of advantages and disadvantages of various methods of securing the transport of farm crops from farm to local shipping point. A very useful source of information on one item of cost of farm crops, especially for distant markets.)

3. ANNENSKI, N. T. Cost of production of grain on private estates. Vol. i of *Influence of Crops and Prices of Grain on certain aspects of the Russian Economic Situation.* St. Petersburg, 1907.

4. BACKMAYR-HEYDA, L. The most favourable time for the yearly closing of farm accounts. *Monatshefte für Landwirtschaft*, year VI, pp. 161–73. Vienna, June, 1913.

(The writer discusses this question mainly with the object of

eliminating the difficulties attendant on the valuation of standing crops and unsaleable intermediate produce, and points out the advantage of pricing these items at their cost of production. He concludes that the best time to close farm books is at the end of the period during which the chief items are produced.)

5. Bennet, C. M., and Cooper, M. O. The cost of raising a dairy cow. *Bulletin of the U. S. Dept. of Agriculture*, no. 49, pp. 1–23. Washington, Jan., 1914.

(The cost of raising a grazing cow from birth to the first calf. The figures are the result of careful recording for five years on a Wisconsin farm, and are the average cost of 73 heifers. The results are tabulated in detail, and are of considerable interest, but the abstract given in the Rome Bulletin, from which the note is made, does not give the basis of the valuation of the foods consumed which form the principal item of cost, and in connexion with which errors are most frequently made.)

6. Bernard, P. The economic limit of sugar-beet growing. *Le Progrès agricole*, year XXVIII, no. 1392, pp. 229–30; and no. 1393, pp. 249–50. Amiens, March, 1914.

(A determination of the limitation placed on beet-growing by the cost of transport. The writer first ascertains the cost of a ton-mile of beet, and of the cost of producing the crop, and concludes that a four-mile radius from the factory is the extreme limit within which carting by horses will be found profitable.)

7. Bonansér, S. Cost of milk production in Mexico. *Gaceta de Agricultura y Veterinaría*, year IV, no. 7, pp. 1–3. Mexico, July, 1913.

(No information is given as to the basis of valuation for certain important items of cost.)

8. Book-keeping competition for small and medium-sized farms in East Prussia. *Georgine, Land- und Forstwirtschaftliche Zeitung*, year VII, no. 40. Königsberg, May, 1914.

(A competition, organized by the East Prussian Chamber of Agriculture, for farmers of holdings not exceeding 247 acres, with the object of encouraging them to keep simple accounts to show the farm and household expenditure and income. The question of costs is not involved.)

9. Boss, *see* Hays.

10. Brand, *see* Fraser.

11. Brinkmann, Theodor. Some considerations on the chapter of

'Capital and Cost of Rural Structures', *Fühlings Landw. Zeitung*, 60. Jahrg., Heft 21, pp. 721-52. Stuttgart, Nov. 1, 1911.

(A study of the cost of the permanent equipment of agricultural holdings, i. e. buildings, &c.)

12. Bude, A. Intermediate valuation of 'not marketable' produce of the farm in agricultural book-keeping. *Archiv für exakte Wirtschaftsforschung*, ii, complementary part, pp. 101-64. Jena, 1913.

(A proposal to value 'non-marketable' foods on the basis of their starch equivalent, using the price on the spot of 1 lb. of starch value in bought foods, with certain allowances. The system seems to fail in that it ignores the cost price of these non-marketable foods.)

13. Butz, O. Three years' returns of the Co-operative Association's Pasture at Klein-Mühlingen in Anhalt. *Landwirtschaftliche Umschau*, year V, no. 7, pp. 133-5. Magdeburg, Feb., 1913.

(A calculation of the cost of grazing per day, in the three years 1910-12.)

14. Butz, O. Two years' results from the co-operative pasture at Coswig, in Anhalt. *Landwirtschaftliche Umschau*, year VI, no. 8, pp. 171-2. Magdeburg, 1914.

(A calculation of the cost of a grazing day on this pasture. Foals and heifers were the stock grazed, and in the calculation a foal's day was taken as equivalent to 1¼ heifer-days.)

15. Chierici, R. A critical study of the methods of valuation. *Annali della Società degli Ingegneri-Architetti Italiani*, year XXX, part 16, pp. 302-4, &c. Rome, 1915.

(In this paper the writer discusses the systems of valuation of land, criticizing particularly Prof. Aereboe's arguments.)

16. Chubbock, M. Profits and loss in the dairy business of Chemung County, New York. *American Agriculturist*, vol. xcvi, no. 25, p. 9. New York, Dec., 1915.

(The cost of food in the production of milk in the district named. The principles upon which the cost of the home-grown foods is determined are not stated.)

17. Clausen. Cost of rearing a calf. *Landwirtschaftliches Wochenblatt für Schleswig-Holstein*, year LXIII, no. 44, pp. 883-4. Kiel, Oct., 1913.

(An analysis of the cost of feeding a calf to six months of age. Other costs and credits for food residues are not included in the calculation.)

18. Cooper, *see* Bennet.

19. Cost of production of the main cereals in European Russia. Agricultural and statistical data, according to information supplied by farmers. St. Petersburg, 1890.

20. CROWTHER, CHARLES. Cost of food in the production of milk. *The University of Leeds and Yorkshire Council for Agricultural Education, Bulletin* 86, 1912.

21. CROWTHER, CHARLES. Cost of food in the production of milk. *The University of Leeds and Yorkshire Council for Agricultural Education, Bulletin* 88, 32 pp., 27 tables. 1913.

(This is an important investigation of the cost of feeding cows, representing one of the earliest examinations of farming costs made in this country. The nominal basis of the charges for the various foods consumed is their cost to the farmer. In the case of bought foods this is readily determined, and in the case of foods grown on the farm, figures are used which have been agreed upon as fair average costs between the author of the paper and the farmers collaborating with him. Probably some of these figures would have been modified if it had been possible to calculate the costs from daily records of operations on the farms instead of estimating them ; but it was not possible to incur this amount of labour, although the difficulty of getting satisfactory results by any of the other means is fully recognized. Some of the figures assumed seem to indicate that estimated cost prices have been affected to a certain extent by local market prices. Recent newspaper controversy on the cost of certain farm products has shown that it is not always easy to satisfy the producer that the price which some one will pay for his stuff need have no relation to its cost to him. The determination of the actual cost of home-grown foods is fundamental in all calculations of the cost of animal products.)

22. Dairying *v.* Wheat-growing in Queensland. *Queensland Agricultural Journal*, vol xxviii, part 4. Brisbane, April, 1912.

(A comparison of the costs and profits of dairying and corn-growing in Queensland. The figures are given in detail but without any discussion of the methods by which they were calculated.)

23. Depreciation rates for agricultural machinery, inquiry into the most usual, in Minnesota, U.S.A. *Farm Implement News*, vol. xxxvii, no. 22, p. 18. Chicago, June 1, 1916.

(This is a valuable investigation conducted by the Farm Economics Bureau of the Minnesota College of Agriculture. The results are based on observations on the usage of the principal agricultural machines during ten years, and are given in the form of percentages of the cost of the machines, and also as a charge per acre. Some of the results are a little unexpected, as, for example, a depreciation of 6·54 per cent. on binders against one of 9·27 on reapers.)

24. Economics of Agriculture, Institute for the study of the, in Great Britain. *Journal of the Board of Agriculture*, vol. xviii, no. 12, p. 1029. London, March, 1912.

(A statement of the need for the investigation of farming costs.)

25. Ernst, Hamza. Increase of yield of soil in the Alpine regions of Salzburg, Austria. *Wiener Landwirtschaftliche Zeitschrift*, no. 52, pp. 407–9. Vienna, June 30, 1915.

(Figures for the cost of bringing land under cultivation in this region.)

26. Evans, H. A. The cost of establishing an orchard. The cultivation of the apple in Tasmania. Hobart, 1914.

(A statement of the cost of establishing two apple orchards in Tasmania, one of 25 acres and the other of 100 acres.)

27. Farm Crops in 1909, Cost of producing. *Crop Reporter, U.S.A. Dept. of Agriculture.* Corn (Maize), vol. xiii, no. 4, pp. 30–1. Wheat, vol. xiii, no. 5, pp. 36–7. Oats, vol. xiii, no. 6, p. 47. Barley, vol. xiii, no. 10, p. 80. Potatoes, vol. xiii, no. 11, p. 87.

(These reports show, in tabular form, the results of an inquiry conducted by the U.S. Dept. of Agriculture. The method of inquiry was that of sending out schedules of inquiry to over 5,000 correspondents of the Bureau of Statistics. The tables are detailed and are informative on costs at this period.)

28. Farm Economics in Austria, Accountants' offices for the study of. (Communication by the Chev. de Pozzi, Delegate of Austria to the International Institute of Agriculture.)

(An account of the extent and ramifications of the farm accountants' offices for the study of farm economics set up by the various provincial councils of agriculture, in Austria, with the encouragement and financial support of the Ministry of Agriculture.)

29. Farm Management Association, The American. *Reports of the 1st and 2nd Annual Meetings.*

(Reports on the scope of the work of the Association.)

30. Farming Accounts: Cost of Production. *Journal of the Board of Agriculture*, pp. 1077–80. February, 1917.

(This is a short article of purely destructive criticism. The anonymous author follows a line of argument not uncommon among the indolent and reactionary, that farming is not like other industries, and that processes and methods which have justified themselves

over and over again in the organization of other forms of enterprise do not apply to agriculture. From internal evidence it is clear that the author has never attempted 'costing' on his own account, or he would have escaped some of the more obvious pitfalls into which he has fallen. 'Take the case of roots; let it be assumed that an accurate cost account has been produced and that it shows that roots are not profitable.' If the writer had ever kept a root account he would have realized that the element of profit or loss does not enter into it. A root account is merely a determination of the cost of one of the foods required for live stock. Later, the author refers to what he terms the 'horse-cycle' and the 'manure-cycle' as being 'problems of which the solution is still wanting. . . . Since the cost of horse-labour must include a charge for food which the horses consume, it is obvious that a guess must be made in ascertaining the cost of the crop'. In point of fact, the only obvious thing is that not only has the author never kept a horse labour account but neither has he thought very carefully about the items composing it. Had he done so, he would have realized that crops of this year are produced by the labour of horses fed on the crops of last year, and that his 'horse-cycle' is rather of the nature of a mare's nest. Similarly, too, with his 'manure-cycle'. With elementary misconceptions of this kind occurring in every paragraph, it is not surprising to find the author falling into more excusable errors, such as the assertion that if products which might be sold are fed to stock on the farm they must be charged at market prices, and one can agree cordially with his remark that accounts kept in this way 'become puzzling'. Anonymous criticism of scientific work carries little weight, for the value of the opinions expressed depends on the status of the critic in relation to the subject with which he deals. Regarded as criticism, this particular article is worthless, and surprise may be expressed that it should have been given publicity in the Board's *Journal*. It is of interest, however, as bearing witness to a tendency, which is far too common, to discredit new lines of investigation and research.)

31. Field Crops, Cost of production of. 1. Wheat. *Victoria Journal of Agriculture*, June, 1915, and May, 1916.

(These articles deal with the cost of production of wheat on the Central Research Farm, Werribee, Victoria. The methods of keeping records and arriving at results are described to some extent. There is a considerable element of 'conventional' figures or estimates, especially in regard to the cost of maintaining horses, but the tables are useful because little information as to farm costs in Australia is available.)

32. FOARD, *see* Johnson.

33. Fraser, W. J., and Brand, R. C. Four systems of dairy farming and profit on each. (*University of Illinois, Dairy Dept. Circular*, no. 151.) Abs. *Farmer's Voice*, Bloomington, Illinois, Oct. 1, 1911.

(A comparison of the economy of varying systems of dairy-farming, based on the amount of milk and butter-fat produced per acre under each. The methods of the calculation are fully explained.)

34. Fraser, W. J. To simplify methods of determining the profit or loss of milk cows on the farm. *U. S. Dept. of Agr., Farmers' Bulletin*, no. 469. *Experiment Station Work*, lxvi, pp. 1–24. Washington, 1911.

(An account of the method of valuing cows, and for obtaining a profit and loss statement for individual cows, based on the milk yield. Thus, while certain charges such as interest, taxes, and repairs are distributed over the herd at per head, others such as labour, foods, veterinary service, &c. are distributed on the basis of the milk yield. The cows are credited with the value of the milk, calves, and manure produced, the figures allotted being proportionate to the milk yield also. Thus, a cow giving 4,000 lb. milk will be credited with twice as much for milk products as a cow giving 2,000 lb.; and the calf from the 4,000 lb. cow is valued at twice as much as that from the 2,000 lb. cow. It is an ingenious system of calculation, and it is based on the results of 15 years' work at the Illinois Station, but some of the principles, such as that on which calves are valued, seem rather theoretical, and out of accord with known facts.)

35. Garrad, G. H., and Mackintosh, J. The cost of food in the production of milk in the counties of Kent and Surrey. *South-Eastern Agricultural College, Wye. First Report*, 1911.

36. Garrad, G. H., and Mackintosh, J. *Ibid., Second Report*, 1912, pp. 1–28.

37. Garrad, G. H. *Ibid., Third Report*, 1914.

38. Garrad, G. H. *Ibid., Fourth Report*, 1915.

(Investigations of the cost of feeding cows, carried out upon lines similar to those of Dr. Crowther's Report, q. v., p. 124.)

39. Giagnoni, C. Cost of work in farming. *Agronomia*, year IV, no. 19, pp. 273–86. Buenos Ayres, August, 1913.

40. Grain Production in Canada, 1911, Cost of. Census and Statistics Office, Ottawa. Vol. v, no. 45, 1912.

41. Ibid., vol. vii, no. 76, 1913.

(These reports are the result of an inquiry conducted by sending schedules to crop correspondents. The nature of the schedules is set out, and the results of the inquiry are given in tabular form. The inquiry was repeated in 1913 and the results given in the *Census and Statistics Monthly.*)

42. Grapes, Cost of producing. *Farmer's Advocate*, vol. xlvi, no. 942, pp. 1606–7. London, Canada, Sept. 28, 1911.

(A calculation of the cost of producing grapes on a 21 acre plantation in the Niagara peninsula, which gives no particulars of the method adopted in arriving at the result.)

43. GROSSMANN. Work and wages of foreign labourers in Prussia. *Georgine, Land- und Forstwirtschaftliche Zeitung*, year VII, no. 28, p. 248. Königsberg, April, 1914.

(The cost of summer and autumn farm labour as performed by piece-work by the foreign labourers who migrate annually into Prussia.)

44. GUFFROY, CH. An example of agricultural book-keeping on the card system. *Journal d'Agriculture pratique*, year LXXVIII, vol. i, no. 1, pp. 13-16. Paris, Jan., 1914.

45. GUNGERICH. Statistical data on the economy of the farms belonging to the Co-operative Book-keeping Association of Königsberg in Prussia. *Georgine, Land- und Forstwirtschaftliche Zeitung*, year VII, no. 51, p. 437 ; no. 53, pp. 453–4. Königsberg, June and July, 1914.

(Statistical data on the lines of those in the report of the farm book-keeping department of the German Agricultural Society already quoted.)

46. GUNGERICH. The net returns of farms connected with the Book-keeping Association at Königsberg in Prussia. *Georgine, Land- und Forstwirtschaftliche Zeitung*, year VI, no. 45, pp. 338–9. Königsberg, June, 1913.

(A statement of the net returns from farming and of the income and expenditure per acre between 1904 and 1912.)

47. GUNGERICH, *see* Heumann.

48. GUTKNECHT, PAUL. Studies on the technical organization of agriculture as carried on in Borde and the adjoining districts under the influence of intensive cultivation of hoed crops, pp. 1-84. Berlin.

(A very full statistical survey of this arable-farming district, in which the holdings are classified under three heads according to size. The writer obtains a basis for the comparison of the stock-carrying capacity of farms by reducing the live stock to 'heavy cattle units', by which is understood one bull, one bullock, either for draught or for the butcher, or one milch cow. A horse is taken at $1\frac{1}{3}$ units; a foal at $\frac{2}{3}$; a calf at $\frac{1}{2}$; a medium-sized pig at $\frac{1}{4}$; and a sheep at $\frac{1}{10}$. This basis may be compared with that suggested on p. 94 of this Report. Other figures of interest to the student of the determination of the cost of production will be found.)

49. Hays, W. M., Boss, A., Wilson, A. D., and Cooper, T. Farm management investigations in the United States. *U. S. Dept. of Agr., Bureau of Plant Industry, Bulletin*, no. 236. Washington, April 15, 1912.

(A description of a scheme for assisting farmers to study the management of their holdings with the aid of book-keeping, so that they may be able to compare the relative advantages of various practices.)

50. Hays, W. M., and Parker, E. C. The cost of producing farm products. (Methods of investigation and costs of growing Minnesota field crops, 1902, 1903, 1904.) *U. S. Dept. of Agriculture, Bureau of Statistics, Bulletin* 48, pp. 86. Washington, 1906.

(One of the earliest of the surveys conducted under the auspices of the U.S.A. Dept. of Agriculture. The methods of inquiry are fully set out, together with the results. The analysis of results was intended to show farmers how economies could be made in the use of various factors of production, and to show the different results of operations conducted in various ways and on different scales. An extremely useful study.)

51. Hedrick, P. Ten years' profit from an apple orchard. *New York Agricultural Experiment Station Bulletin*, no. 376, pp. 81–90. Geneva, New York, 1914.

(An analysis of the cost of a barrel of apples from a New York State orchard.)

52. Heumann and Gungerich. Statistics of the Agricultural Book-keeping Co-operative Society. *Georgine, Land- und Forstwirtschaftliche Zeitung*, Nr. 20 und 25. Königsberg, March 9 and 28, 1912.

(An investigation, through the farm accounts kept by the Society, of the income and expenditure upon land in East Prussia, and the net economic results per acre.)

53. Hockner. Intensive feeding of milch cows. *Deutsche Landwirtschaftliche Presse*, year XL, no. 32, pp. 388–9; no. 33, pp. 303–4; and no. 35, pp. 429–30. Berlin, April, 1913.

(A statement of the cost of cow-keeping in the years 1909–11, adopting a system of feeding according to the performance of each animal. Prices at which produce is charged are given, but there is no indication of the basis for these charges.)

54. Holz, *see* Thorn.

55. Johnson, O., and Foard, W. *University of Missouri College of Agriculture, Agric. Experiment Station Bulletin*, no. 125, pp. 289-316. Columbia, Missouri, Feb., 1915.

(An analysis of the cost of cereal crops and of the keep of milch cows.)

56. von Koppen, W. Principles of exact investigations in Agriculture. *Archiv für exakte Wirtschaftsforschung*, Supplement 13, 88 pp. Jena, 1914.

(A discussion of the advantages of systematic book-keeping to the farm manager, illustrated by an example from the author's own farm books. The abstract does not clearly convey the exact nature of the system, but the principle of valuing intermediate profits at market prices is adopted, in fact, the author emphasizes the need for revising the prices charged for home-grown produce consumed at home at intervals of not more than four weeks, so as to bring in the fluctuations of the market. This seems enough to condemn the system, whatever other merits it may possess.)

57. Kotelnikov, V. Cost of production of the principal cereals in European Russia. *Russian Ministry of Agriculture's Review of Agriculture and Sylviculture*, vol. CCL, year LXXVI, pp. 451–9. Petrograd, March, 1915.

(The inquiry upon which these figures are based was conducted by means of a form of questions sent out by the Ministry of Agriculture. The number of replies was 5,169, of which 3,737 related to peasant farms, and 1,442 to those of large landowners. Rye, oats, wheat, and barley are the cereals concerned, and although it is almost certain that the costs returned by the farmers would be estimates rather than calculations, the results are of value to the English farmer for purposes of comparison, as being those of a large competitor.)

58. Langenbeck, E. Some figures obtained by experiment for use in the estimation of crops. *Mitteilungen der Deutschen Landwirtschafts-Gesellschaft*, Stück 43, Jahrgang 1911.

(Figures collected by the German Agricultural Society to show the ratio of straw to grain, by weight, in the commoner cereal crops.)

59. Langenbeck, E. Some results of the Agricultural Book-keeping Bureau of the German Agricultural Society. *Arbeiten der Deutschen Landwirtschafts-Gesellschaft*, Heft 180, pp. 1–64, 8 Tafeln und 7 Tabellen. Berlin, 1911.

(A comprehensive study of farming economics on 78 farms in various parts of Germany. The results are given mainly in cost of equipment, numbers of live stock, receipts and payments, cost of

labour, &c., per acre, or per 100 acres on farms of certain types; but the cost of maintaining all classes of live stock is worked out, though without any discussion of principles of valuation.)

60. Laur, Ernst. Basis for International Statistics of Agricultural Book-keeping.

(This article, written for the International Institute of Agriculture and appearing in the *Monthly Bulletin of Agricultural Intelligence and Plant Diseases*, in February, 1914, is aimed at the setting-up of a common system of book-keeping for the examination of the economic conditions of Germany. The writer recognizes that the methods based on book-keeping give results much superior to those based on inquiry, but he points out that if the results of investigations in different places are to be comparable one with another they must be collected and elaborated according to the same methods. He then proceeds to describe what figures and books are necessary in order to calculate the gross and net returns on the farm, the farmer's profit, and so forth. His system amounts to what is taught in the country as book-keeping by single entry, but Laur is also the principal exponent of what is known as the 'synthetic' system for the determination of the cost of production—not as opposed to the analytical, but as being more easily practised. He gives a short example of the cost of producing milk, calculated in this way. By those familiar with ordinary farm accounts the paper will be found to be fairly elementary, and the points on which discussion would have been instructive, namely, principles of valuation, are left untouched for lack of space, and the reader is referred to his great treatise on farm book-keeping. Finally, he suggests that if uniformity of principle—not necessarily of practice—could be arrived at, the International Institute might act as a clearing-house for the agricultural book-keeping of 'all civilized peoples'. The article is well worthy of study, but it loses, in places, by having been translated by some one unfamiliar with the English equivalents of some of the German terms of accountancy.)

61. Laur, Ernst. Influence of the size of farms on their gross yield. *Archiv für exakte Wirtschaftsforschung*, vol. vii, nos. 2 and 3, pp. 248–87. Jena, 1916.

62. Laur, Ernst. Methods adopted for judging the economic results of peasant farming. *Landwirtschaftliches Jahrbuch für Bayern*, year V, no. 2, pp. 95–113. Munich, 1915.

(Dr. Laur starts with a preliminary discussion of standards of comparison and then passes to the consideration of means by which to determine questions of policy in farm management. In the absence of systematic book-keeping on these small farms, he shows, by the application of certain formulae, how to decide for example

between the relative advantages of milk-selling and calf-raising. Allowing that 10 lb. of milk will produce 1 lb. of live-weight increase, he says that the following formula will give the price at which milk must be sold to give the same net return as when used for fattening calves:

Utility value of milk

$$= \frac{(\text{increase in weight} \times \text{selling price}) + (\text{initial weight} \times \text{advance})}{10 \times \text{increase in weight}}.$$

The term 'advance' refers to the difference in price per lb. of live-weight between a fat and a store calf. Other formulae for milk *versus* beef, &c., are given. He also suggests the determination of the cost of production by the synthetic method devised by him, as a basis for organization.)

63. LAUR, ERNST. Researches on the profits of farming in Switzerland for the year 1910–11. *Rapport du Secrétariat suisse des paysans au Département fédéral de l'Agriculture.* 1er fasc., pp. 152. Berne, 1912.

(An analysis of farm income and expenditure, on an acreage basis, on a large number of Swiss farms, divided into groups according to size and style of farming.)

64. LAURENT, F. The cost of production of wheat. *Société centrale d'Agriculture du Département de la Seine-Inférieure,* year CLIII, new series, no. 21, pp. 118–25. Rouen, 1913.

(A calculation of the cost of production of wheat under varying degrees of intensive farming, showing that the cost falls as the intensity increases. Obviously there must be a limit to the extent to which this conclusion could be carried.)

65. LEWIS, C., and VICKERS, H. Economics of apple-orcharding in the Pacific North-west. *Oregon Agricultural College Experiment Station, Bulletin,* no. 132, 104 pp. Corvallis, Oregon, June, 1915.

(A study of the cost of fruit production on a thousand orchards.)

66. LIVERMORE, *see* Warren.

67. MACKINTOSH, JAMES. Milk records and the cost of feeding cows in Berkshire, 1913. *Bulletin XIX, University College, Reading, Faculty of Agriculture and Horticulture,* 50 pp., 13 tables. 1914.

68. MACKINTOSH, JAMES. The cost of food in the production of milk in Berks. and Bucks., 1913–15. *Bulletin XXVII, University College, Reading,* 92 pp., 30 tables. 1916.

(Investigations upon the cost of feeding cows, carried out on lines similar to those of Dr. Crowther's Report, which see p. 124.)

69. MACKINTOSH, *see* Garrad.

70. MARESCH, H. Influence of the distance from the market on farming in fifty Moravian farms. *Österreichische Agrarzeitung,* year V, no. 7, pp. 76–89. Vienna, March, 1914.

71. McBurritt. A successful New York farm. *U.S. Dept. of Agriculture, Farmer's Bulletin*, no. 454, p. 32. Washington, July 12, 1911.

(A calculation of the cost per acre and per bushel of the potato crop in New York State for the nine years 1901–9. No information is given of the methods by which the items of cost were calculated.)

72. McMillan, J. G. The financial aspect of cheese-making in New South Wales. *The Agr. Gazette of N. S. W.*, vol. xxii, part 9, p. 771. Sydney, Sept., 1911.

(Details of the cost of cheese-making at the Hawkesbury Agricultural College.)

73. Minkler, F. C. Cost of producing milk at the College Farm of the New Jersey State Agricultural College and Experiment Station. *Thirty-first Annual Report of the New-Jersey State Agr. Exp. Station*, vol. i, pp. xv and 424. *Report of the Animal Husbandman*, pp. 51–67. Paterson, N. J., 1911.

(The writer gives the total cost of milk production on the College farm (*a*) pricing home-grown foods at the cost of production, (*b*) pricing them at market prices. By the former process the cost of each cow was £33 4*s*. per annum; by the latter it amounted to £38 8*s*. The writer does not discuss the comparative soundness of these methods of calculation.)

74. Missouri Farms, Costs of production on. *Missouri Agricultural Experiment Station, Bulletin* 125, 1913.

(This bulletin describes methods of keeping the accounts and shows results on several farms. The report contains graphs and tables of an informative character.)

75. Moravian peasant farmers, The private economic conditions of. *Zentralblatt für Landwirtschaft*, year XCIII, no. 22, pp. 253–5. Brünn, Nov., 1913.

(A study based on the accounts of 79 Moravian peasant farms, apparently those furnishing the information used in the paper referred to later—no. 81.)

76. Orwin, C. S. The determination of the cost of production. *Journal of the Board of Agriculture*, vol. xxi, no. 3, pp. 193–201. June, 1914.

(An article to emphasize the need for further consideration of methods, with the object of bringing about greater uniformity in the conduct of research work, as illustrated by certain published reports on farming costs.)

77. Orwin, C. S. *Farm Accounts.* Cambridge University Press. 209 pp. Cambridge, 1914.

(A study of the control of the farmer's business by means of scientific book-keeping, for the determination of the cost price of

agricultural products, with a description of the methods by which they can be effected. The principles of valuation are discussed and contrasted, the writer endeavouring to show that in valuations on the farm, both of stock and of crops, the farmer should use the cost price, and that he should not confuse the issue by the introduction of market prices. It is maintained that this is the key-note of all determinations of costs on the farm, and the general acceptance of this principle is an essential preliminary to co-ordinated research work. For the needs of the student the technical processes of double-entry book-keeping are described, with the aid of an example taken from actual practice.)

78. OSTERMAYER, ADOLF. Farming problems considered in the light of the cost of production, and net returns. *Archiv für exakte Wirtschaftsforschung*, vol. iv, part 4, pp. 608–36.

(An article to illustrate the value of a knowledge of farming costs in considering policies of management.)

79. OSTERMAYER, ADOLF. Limits of profitableness of farm expenses in the Peasant Farms of Moravia. *Zentralblatt für Landwirtschaft*, year XCIII, no. 18, pp. 205–8. Brünn, Sept., 1913.

(An investigation of the effect of the increase of expenditure in capital and labour on the returns from farms of various sizes.)

80. OSTERMAYER, ADOLF. The organization of team work according to the results of book-keeping and to net returns. *Mitteilungen der landwirtschaftlichen Lehrkanzeln der k. k. Hochschule für Bodenkultur in Wien*, vol. ii, part 3, pp. 411–31. Vienna, 1914.

(A comparison of the cost of labour performed by draught animals with the net returns from farming. The writer shows that the cost may run from 11 per cent. of the total cost of the production of cereals in flat country to 28·2 per cent. for sugar beet in hilly country, and gives tables illustrating the dependence of high returns on the effective use of the draught animals—horses, oxen, and cows. The advantages of each of these forms of team labour are considered in relation to different types of farming, but the fact that oxen and cows are no longer in use for draught purposes in this country deprives this part of the paper of anything more than an academic interest.)

81. OSTERMAYER, ADOLF. Proportion of area occupied by the various crops and net profit. *Zentralblatt für Landwirtschaft*, year XCIII, no. 18, pp. 205–8. Brünn, Sept., 1913.

(A consideration of the most favourable arrangement of farming lands, i. e. the proportion of arable, grass, &c., based on the examination of the accounts of 79 farms in Moravia.)

82. Otis, D. H. The farm as a business enterprise. *The Country Gentleman.* Philadelphia, June 8, 1912.

(An investigation of the net returns of a dairy farm regarded as a whole, without consideration of the results in the various branches of the enterprise.)

83. Page, A. W. Cost of running a peach orchard in North Carolina, U.S.A. *The Country Gentleman,* vol. lxxx, no. 47, pp. 1750 and 1772. Philadelphia, Nov. 20, 1915.

(This report is an interesting and valuable example of farmers' enterprise in U.S.A. The farmers of Moore County, North Carolina, have established an organization known as the Sandhill Board of Trade, the chief object of which is to determine the cost of production of the crops of the district. The example given is that of a ninety-acre peach orchard belonging to the Carolina Fruit Company, and the costs and results are very completely worked out.)

84. Parker, E. C., *see* Hays.

85. Pauli, W. Calculation of the cost of production in peasant farms, with special reference to milk. *Archiv für exakte Wirtschaftsforschung,* Supplement, part 7, pp. xi and 333. Jena, 1913.

(The writer starts with a general statement of the methods employed in determining cost of production, both by analytical accounts and by more arbitrary means, and then proceeds to a discussion of the system to be adopted in the valuation of intermediate products grown on the farm, the distribution of the cost of manuring within the rotation, and the distribution of general expenses. He then goes on to consider the cost of production of milk on a large number of peasant farms by the so-called synthetical method of Laur, the practice of analytical book-keeping by double entry not being considered possible on these small holdings. The paper appears to be one of considerable importance.)

86. Porter, W. R. Cost of producing farm crop. *North Dakota Agricultural Experiment Station, Bulletin* 104, 1913, pp. 117.

(A record of costs of production on farms under the control of the North Dakota Agricultural Experiment Station. The methods of securing data and making calculations are fully stated.)

87. Pugsley, C. W. Cost of growing crops in Nebraska. (*Nebraska Station, Bulletin* 122, pp. 3–12.) *E. S. R.,* vol. xxv, no. 7, pp. 690. Washington, 1911.

(The costs comprised in this report relate to maize, wheat, oats, and hay. They were collected, by correspondence, from a number of farmers in Nebraska, but the methods employed by the farmers in arriving at their figures are not stated.)

88. Report of Saskatchewan Grain Markets Commission. Cost of Production, Section V. Cost of Marketings, Section VI. Regina, 1914.

(The information on costs of production was collected by the circulation of a *questionnaire* amongst farmers. The results were carefully sifted and give fairly reliable information on costs of production in Saskatchewan in 1913. The information on costs of marketing was obtained by following shipments through various processes and various hands. Though perhaps not strictly accurate, the sections provide reliable information on methods, and give close indications of the costs of marketing Canadian wheat.)

89. Rubinow, I. M. 'Russia's Wheat Surplus.' *U.S. Dept. of Agriculture, Bureau of Statistics, Bulletin* 42, 1906, p. 103. (For costs of production see pp. 81-7.)

(A very useful study of the conditions under which wheat is grown and marketed in Russia. The information on costs was collected from Russian sources, and was very carefully sifted and explained.)

90. Sagawe, B. The economic importance of beet-growing. *Archiv für exakte Wirtschaftsforschung*, vol. vi, part 8, pp. 157-209. Jena, 1914.

(An investigation of the cost of beet-growing in comparison with other forage crops, to test the soundness of the advocacy of the latter against the former. The costs of producing many farm foods are given as calculated by Howard and by Ostermayer.)

91. Schulze, G. Giving farm labourers a personal interest in their work. *Landwirtschaftliche Jahrbücher*, vol. xlvi, no. 1, pp. 44-88. Berlin, 1914.

(This is a report of the means adopted on a large number of German farms by which to give managers and labourers a personal interest in their work. The inquiry was conducted by means of forms of questions sent to farmers, and the writer discusses the possibilities of adding to the advantage of large-scale production that of the personal interest at present enjoyed mainly by small occupiers.)

92. Sedlmayr, E. C. Calculation of the cost of production of agricultural produce. *Mitteilungen der landwirtschaftlichen Lehrkanzeln der k. k. Hochschule für Bodenkultur in Wien*, vol. i, part 2. Wien, July, 1912.

(This is an important paper in which the author discusses the difficulties which are encountered in calculating the cost of production by analytical methods. The criticism is in the main sound, as, for example, when the writer points out the virtual impossibility of distributing accurately those expenses which benefit more than one particular product, but a good deal of Sedlmayr's argument loses point by the fact that he appears to confuse the cost of certain operations with their economical effect. The latter may be *nil*, but that will not justify the omission of the former from a cost-of-production calculation ; *vice versa*, the economic effects may be valuable out of proportion to the cost, but the cost must be the figure used, and not an estimate of value. Similarly, Sedlmayr objects that it cannot be correct to value home-grown produce consumed by stock at the cost of growing it where there is an open market for it at a higher price. This is a flat contradiction of his opening formula: 'Aufwand = Produktionskosten' (*Expenses = Cost of Production*), for the expense of home-grown foods in, say, the production of milk is the cost of growing them, not the value of them to another consumer. In spite of his criticism of analytical book-keeping for the determination of the cost of any product, Sedlmayr admits and even emphasizes the importance of it for certain purposes, such as the comparison of the costs of similar crops. Such results though not, as he thinks, intrinsically trustworthy, are comparable one with another, because they are influenced by the same degree of error. He also recognizes that the mere translation into figures of the whole complex process of production may often bring important facts to light.)

93. Small farmers in East Prussia, Prizes for book-keeping by. *Georgine*. Königsberg, March 2, 1912.

(A scheme arranged by the East Prussian Agricultural Chamber for encouraging small farmers in book-keeping. The accounts are the usual form for trading accounts, with the addition of the provision for recording the home consumption of farm produce.)

94. Spillmann, W. J. The farmer's income in the United States. *U. S. Dept. of Agr., Bureau of Plant Industry*, Circular no. 132, pp. 3–7. Washington, July, 1913.

(A calculation of the average income of farmers in the U.S.A., compiled from the information available in the Census returns and certain factors derived from the experience of the Office of Farm Management.)

95. Spillmann, W. J. Influence of the size of the farm upon the wages of labour in the irrigated sections of the United States. *The Country Gentleman*, vol. lxxx, no. 49, pp. 1832. Philadelphia, Dec., 1915.

(The writer discusses the division of land for farming from the evidence of surveys conducted by the Federal Office of Farm Management, and concludes that while very small farms are not successful the limit in the other direction may be very wide if farming is to be as productive as other forms of enterprise.)

96. SPILLMANN, W. J. The work of the Office of Farm Management. *U.S. Dept. of Agr., Bureau of Plant Industry, Bulletin* 259, pp. 84. Washington, Oct., 1912.

(An account of the work of this branch of the U.S. Department of Agriculture, including its scheme for agricultural cost-accounting.)

97. STABILINI, *see* Stakemann.

98. STAKEMANN. The cost of keeping a heifer up to its first calving. *Deutsche Landwirtschaftliche Presse*, year XL, no. 49, p. 593. Berlin, June, 1913.

Also Stabilini, *Giornale di Agricoltura della Domenica*, year XXIII, no. 25, p. 195. Piacenza, June, 1913.

(Two calculations of the cost of keeping a heifer. The prices charged for milk and for other home-grown foods seem to indicate that market values have been assigned to these items of cost.)

99. STEIGER. Book-keeping results. Five-year averages obtained at the Accountants' Office of the German Agricultural Society. *Arbeiten der Deutschen Landwirtschafts-Gesellschaft*, part 255, pp. 87 and 4 tables. Berlin, 1914.

(The Annual Report of the German Agricultural Society on the work of its book-keeping department on 114 farms. The data is given in the form of tables showing the distribution of capital, the head of stock, crop yields, receipts, payments, net results, &c., on each farm. No costing is attempted, but the comparative degree of success under varying types of management is deduced, and certain other conclusions are arrived at.)

100. STRUTT, the Hon. E. G. Presidential Address to the Surveyors' Institution, Session 1912–13. *Transactions of the Surveyors' Institution*, vol. xlv, part 1.

(A most valuable record of the cost of producing crops on an estate in the east of England, where careful field accounts have been kept. The results cover the period 1894–1911, and 'some striking results are shown which contradict the fashionable theory of writers on agriculture that corn-growing is unprofitable'. In 1894, when wheat touched the lowest price known in this country, namely 22*s.* 10*d.*, and actually sold in some markets at 17*s.* 6*d.*, Mr. Strutt was able to make a profit of £1 18*s.* per acre, or say 10*s.* per quarter, and over the whole eighteen-year period his average profit per acre on over 4,000 acres was £2 18*s.* 8*d.*, or say 15*s.* per quarter. Seeing that rent remains very much what it was in 1911, and that wages and manures, although very much higher in 1914–15, have certainly not increased by 50 per cent., it follows that the present prices of wheat must be very satisfactory to the farmer. The figures include the financial results during the same period of all other agricultural crops more generally grown, and also of many classes of live stock. The methods by which the results are arrived at are fully explained, and the figures deserve the most careful study on the part of those who are responsible at the present time for the control of prices.)

101. Studies in the cost of market milk production. *Michigan Agricultural College*, *Bulletin* 277, 1916.

(The data for this Bulletin was obtained from records kept by 25 farmers under the supervision of a Field Investigator provided by the College of Agriculture. The problems which arise in keeping records are discussed at some length. The results of the investigations are given in tabular form, and reasons for the various results are stated.)

102. Swiss Agriculture, Investigations into the returns of, during the year 1913–14. *Annuaire agricole de la Suisse,* year XVI, pp. 98–258. Berne, 1915.

(A report upon the gross and net returns on 303 Swiss farms in the year 1913–14, compiled from the returns made to the Swiss Peasants' Secretariat. It is interesting to note that since the beginning of the investigations of the Secretariat, in 1901, by means of statistical book-keeping, only two years showed an excess of receipts over payments. Presumably it is the fact that most of these holdings are small family concerns which enabled the occupiers to live in spite of losses. Regarded from the commercial standpoint the success of the farm appears to vary directly with its size.)

103. Swiss Bee-keeping in 1914, Investigation into the returns of. *Schweizerische Bienen-Zeitung*, year XXXVIII, no. 11, pp. 428–35, no. 12, pp. 482–8. Aargau, 1915.

104. Swiss Peasants' Secretariat, The. The income derived from agriculture in Switzerland in the year 1909–10. *Report of the Peasants' Secretariat to the Swiss Federal Department of Agriculture,* pp. 1–148. Berne, 1911.

(A comparison of the value of the gross product with the cost of production on 276 farms.)

105. TANNER, C. The amortization of the capital in buildings in Swiss Agriculture. *Archiv für exakte Wirtschaftsforschung*, vol. v, parts 3 and 4, pp. 530–83. Jena, 1913.

(A consideration of the proper charges for depreciation on farm buildings of various types.)

106. TANNER, K. Determination of the capitalization value of agricultural estates and lands. *Landwirtschaftliches Jahrbuch der Schweiz,* year 28, part 5, pp. 549–732. Berne, 1914.

107. Tassinari, G. A Métayer's family in Chianti (Tuscany). *Atti della Reale Accademia Economico-Agraria dei Georgofili di Firenze*, series 5, vol. xi, no. 4, pp. 283–310. Firenze, 1914.

(A statement of the labour income of a métayer's family in Tuscany, showing total net earnings of £73 2*s.* 3*d.*, representing £18 14*s.* 11*d.* per head.)

108. Taylor, H. C. Methods applicable to the study of economic problems in Agriculture. *University of Wisconsin Agr. Exp. Station, Bulletin* no. 16. Madison, Wisconsin, 1912.

(In this paper the writer discusses the value of various methods employed in the study of agricultural economics, including agricultural accountancy.)

109. Thompson, A. L. Costs of producing milk on 174 farms in Delaware County, New York. *Cornell University Bulletin* 364, 1915, pp. 64.

(The method of securing data for this report was that of the 'survey', which is now so well known in the United States. The method is described to some extent, and the forms used for collecting data are given in an appendix. The report is most exhaustive in dealing with the various phases of dairying and the cost of processes. The results are carefully analysed, and the report gives much information on costs of producing milk in the locality dealt with.)

110. Thomson, E. H., and Dixon, H. M. A farm management survey of three representative areas in Indiana, Illinois, and Iowa. *Bulletin of the U. S. Dept. of Agriculture*, no. 41, pp. 42. Washington, Jan., 1914.

(This is an example of a type of survey which is not infrequently made, with profitable results, in the States. Its main purpose is to investigate the labour income of farmers on farms of different classes and different sizes, but a great deal of other information about the industry is collected at the same time.)

111. Thorn, C. C., and Holz, H. Effect of time and method of tillage on the yield and comparative cost of production of wheat in the Pelouse Region of Eastern Washington. *State College of Washington Agricultural Experimental Station, Bulletin*, no. 123. July, 1915.

(Average prices for the various cultivations were applied to all the farms included in this investigation. The results are of no direct value in this country, but they bring out very clearly the advantages which may be expected to accrue from similar studies in British farming districts.)

112. Vickers, *see* Lewis.

113. Warren, G. J., Livermore, K. C., and others. An agricultural survey of Tompkins County, New York. (*New York Cornell Station*

Bulletin 295, pp. 385–569.) *E. S. R.*, vol. xxv, abstract number, no. 6, p. 594.

(A survey of the conditions affecting the cost of production in the district named.)

114. WARREN, G. F. *Farm Management*, Macmillan and Co. London and New York, pp. xviii + 590.

(See reference to this publication on p. 38 *n.*)

115. WARTRUD, H. Some factors for success in farming in Wisconsin, U.S.A. *Hoard's Dairyman*, vol. xli, no. 3, pp. 97–8. Fort Atkinson, Wisconsin, Feb., 1916.

(A statement of the relation of the 'farmer's managerial income' to the size of his farm, his capital, and the quality of his stock, derived from an investigation of a large number of farms in Wisconsin. A small increase of income is shown with the increase in the size of the holding, whilst a great increase follows the increase in the amount of working capital employed—in fact the limit of profitable increase of capital does not appear to have been reached.)

116. WATERSTRADT, F. Cost of production of milk and beef. *Archiv für exakte Wirtschaftsforschung*, vol. vi, part 1, pp. 137–56. Jena, 1914.

(The writer has investigated the cost of these products on farms of differing types, such as those on which no stock is raised, and those on which all are raised. The abstract in the Rome bulletin does not go into the methods by which the costs were calculated.)

117. WEITZ, G. Silesian grazing farms. *Archiv für exakte Wirtschaftsforschung*, supplement xii, 257 pp. Jena, 1913.

(Full statistical data of thirteen Silesian grazing farms, on some of them for one year only, but on others for two, three, four, five years consecutively. The style of farming enables the cost of production of 1 lb. of live weight to be calculated by a simple process, and also the cost of 1 gallon of milk where dairy stock are grazed.)

118. Wheat, cost of production, marketing, and exporting, in Canada. *Synopsis of the Report of the Saskatchewan Commission on Grain markets*, pp. 1–3. Regina, Saskatchewan, Jan., 1914.

(The figures given here should be of much interest to the English farmer, and if similar statistics could be collected for all the exporting countries of the world—and this is now being attempted at the Institute for Research in Agricultural Economics—it would enable the home industry to form some opinion of the probable course of the wheat market and should provide a basis for the forming of national agricultural policy.)

119. WILSON, *see* Hays.

120. **Wüstendörfer**, K. Difference in the returns of two dairy farms and its cause. *Illustrierte landwirtschaftliche Zeitung*, year XXXIII, no. 56, pp. 516–18. Berlin, July, 1913.

(A calculation of the 'utilization value' of the home-grown foods on two dairy farms. This is a method by which the comparative values of direct and indirect marketing may be compared. All the expenses except the cost of home-grown produce are charged against the cows, and the total is deducted from the receipts for milk. The difference represents the 'utilization value' of the hay, straw, roots, &c., marketed in the form of milk, and a comparison may be made with the results which might have been expected from the direct marketing of this produce.)

121. **Wyllie**, J. Farm valuations for book-keeping purposes. *Journal of the Board of Agriculture*, vol. xxii, no. 12, pp. 1215–28. London, March, 1916.

(The writer of this article presents a clear and convincing statement of the case for making farm valuations on the basis of the cost of production. It is all the more curious, therefore, that he should depart from this principle in the case of certain classes of live stock, and that he should substitute for it a 'standard value basis'. This is neither the cost price nor the market price, but some arbitrary figure for which there is no substantial foundation. It would appear that the writer has accepted the cost principle as the only sound one, but that a difficulty in its practical application in a particular case has driven him to substitute some other value for it rather than to face the difficulty out.)

122. **Zwanowetz**, E. Comparative cost of food for a heifer, stall-fed or at grass, up to her first calving. *Wiener landwirtschaftliche Zeitung*, year LXIV, no. 68, p. 656. Vienna, August, 1914.

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